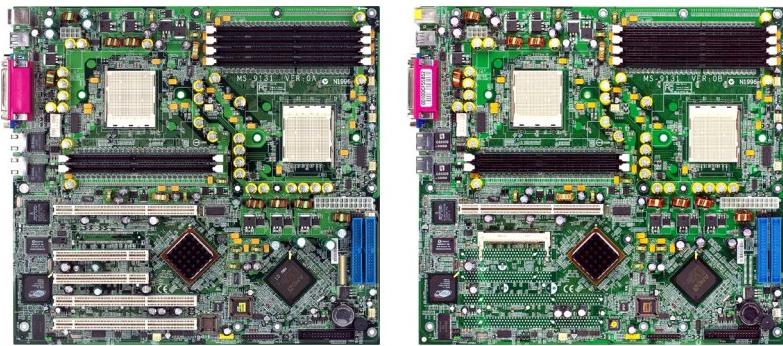




## K8D Master Series

### **MS-9131(v1.X)SSIMainboard**

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K8D Master-F (for Pedestal System) K8D Master-FT (for Rackmount System)

**Version 1.0**  
**G52-S9131X1-K01**

Manual Rev: 1.0  
Release Date: Apr. 2003



### **FCC-A Radio Frequency Interference Statement**

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

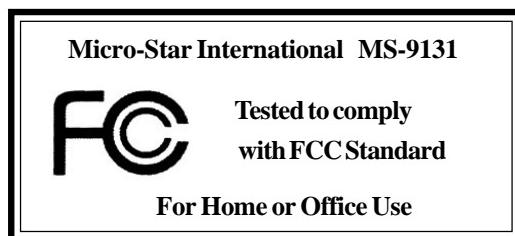
#### **Notice 1**

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

#### **Notice 2**

Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

**VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.**



## **Copyright Notice**

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## **Revision History**

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<b>Revision</b>	<b>Revision History</b>	<b>Date</b>
V1.0	First release	Apr. 2003

## **Technical Support**

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If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.

- ❑ Visit the MSI website for FAQ, technical guide, BIOS updates, driver updates, and other information: <http://www.msi.com.tw/>
- ❑ Contact our technical staff at: [support@msi.com.tw](mailto:support@msi.com.tw)

## **Safety Instructions**

---

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPENINGS.
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
8. Always Unplug the Power Cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening that could damage or cause electrical shock.
11. If any of the following situations arises, get the equipment checked by a service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment has not work well or you can not get it work according to User's Manual.
  - The equipment has dropped and damaged.
  - The equipment has obvious sign of breakage.
12. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60°C (140°F), IT MAY DAMAGE THE EQUIPMENT.



**CAUTION:** Danger of explosion if battery is incorrectly replaced.  
Replace only with the same or equivalent type recommended by the manufacturer.

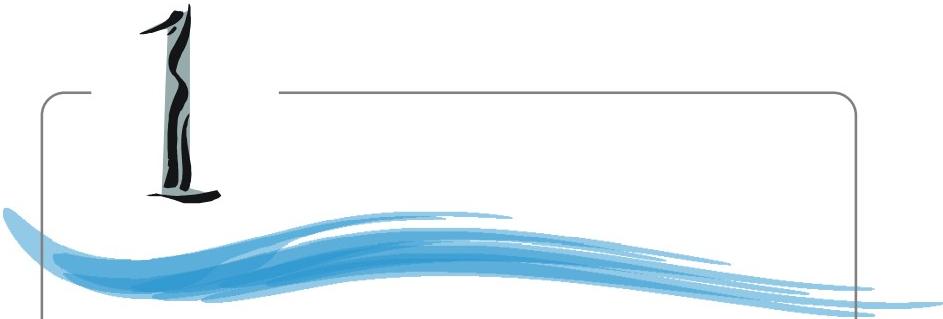
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# 1

## *Getting Started*

Thank you for purchasing the K8D Master Series (MS-9131), an excellent Server System Infrastructure (SSI) mainboard from MSI.

Based on the innovative **AMD-8131 PCI-X Tunnel** and **AMD-8111 I/O HUB** chipsets for optimal system efficiency, K8D Master Series SSI mainboard accommodates dual latest AMD Opteron DP™ processors in the 940-pin lidded ceramic micro PGA package, and supports up to three 144-bit DDR registered ECC DIMMs ( at 200, 266 and 333 MHz ) to provide the maximum of 12 GB memory capacity.

In the entry-level and mid-range market segment, this mainboard can provide a high-performance solution for today's front-end and general purpose server/workstation, as well as in the future.

---

## Mainboard Specifications

### Target Market Segment

- Target in the entry-level and mid-range, front-end and general purpose server market segments.

### CPU

- Supports dual Socket 940 for AMD Opteron DP™ (SledgeHammer DP) processors.
- Supports Opteron DP™ 1400 and higher.
- AMD x86-64 Technology.
  - AMD's 64-bit, x86 instruction set extensions.
  - 64-bit integer registers, 48-bit virtual address, 40-bit physical address.
  - Eight new 64-bit integer registers.
  - Eight new 128-bit SSE/SSE2 registers.

### Chipset

- AMD8131™ Chipset (829-pin BGA)
  - HyperTransport™ technology tunnel with side A (16 bits) and side B (8 bits)
  - Each side support transfer rates of 1600, 1200, 800, and 400 mega-transfer per second.
  - Two PCI-X bridges: bridge A and bridge B (64-bit data bus).
  - 133/100/66 MHz in PCI-X mode and 66/33 MHz in PCI mode.
- AMD-8111™ Chipset (492-pin BGA)
  - HyperTransport™ I/O Hub (support up to 800 megebytes per second with 200 MHz clock).
  - A 33 MHz/32-bit PCI 2.2 compliant bus interface supports up to eight external devices.
  - LPC bus to connect peripheral such as super I/O and BIOS.
  - Extensive ACPI-compliant power management.
  - IOAPCI controller.
  - AC'97 2.2 soft audio controller.
  - USB hosts supporting six ports (USB 1.1 and USB 2.0 optional)

### MainMemory

- 144-bit DDR at 200/266/333 MHz.
- Supports DIMM sizes from 64 MB (128 Mb x 16 DRAMs) to 2 GB (1 Gb x 4

DRAMs).

- Supports interleaving memory within DIMMs.
- Chip Kill ECC allows continuous correction of 4-bit errors in a failed x 4 memory device.

#### **Slots**

- Three 64-bit/100 MHz PCI-X slots.
- Two 32-bit/33 MHz PCI slots.
- One Mini PCI slot (*for K8D Master-FT only*).

#### **Networking**

- Broadcom BCM5704 LAN controller.
- Provides 1000/100/10 MB per second data rates, 64-bit/100 MHz PCI-X bus.
- Dual ports.

#### **Video**

- Integrated ATI Rage XL graphics controller.
- Built-in DVD decoding.
- Provides integrated TMDS transmitter support for Digital Flat Panel (DFP) monitors.
- Onboard 8 MB video SDRAM.

#### **Power Management Features**

- Wake-on-LAN (WOL), USB, PCI, mouse.
- RTC alarm.
- Supports ACPI S1/S4/S5 functions.

#### **System Management**

- SMBus (I2C).
- Temperature, voltage, and fan monitors.
- Chassis intrusion.

#### **BIOS**

- 4 Mb flash EEPROM.
- PCI 2.2 compliant, VPD, and DMI.
- PnP 1.0A, SMBIOS 2.3, ACPI 1.0A/2.0.
- Supports PXE boot protocol.

### **MS-9131 SSI Mainboard**

- APM 1.2, WOL.
- PC2001 system design compliant.

#### **Onboard Peripherals**

- One floppy port supports two FDDs with 360KB, 720KB, 1.2MB, 1.44MB, and 2.88MB.
- One PS/2 keyboard port.
- One PS/2 mouse port.
- Two serial ports (COM1 serial port + COM2 serial header).
- One parallel port supports SPP/EPP/ECP mode.
- Two RJ-45 ports (with LEDs).
- Four USB ports (two on front and two on rear).
- One VGA port.

#### **Dimension**

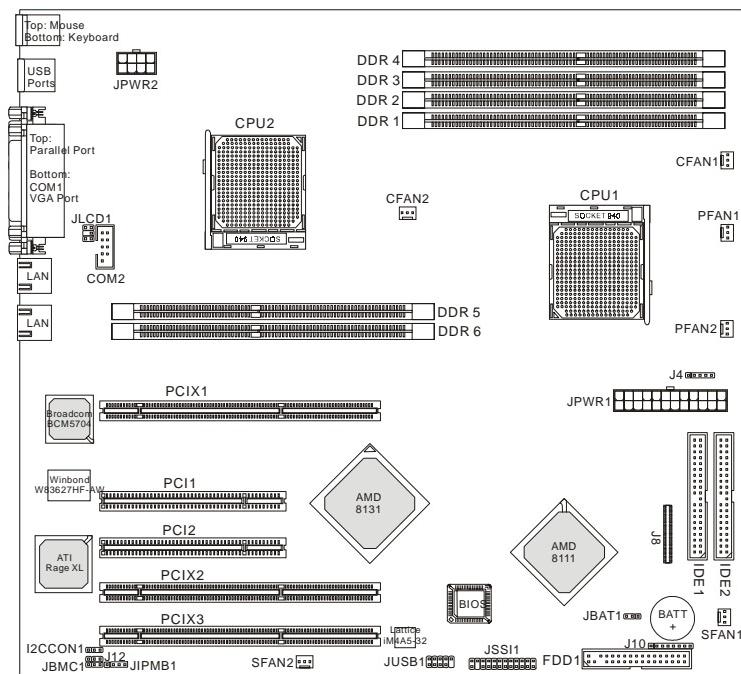
- SSI EEB 3.0 Form Factor: 12.0 x 13.0 inch.

#### **Mounting**

- Twenty-one mounting holes (SSI standard).

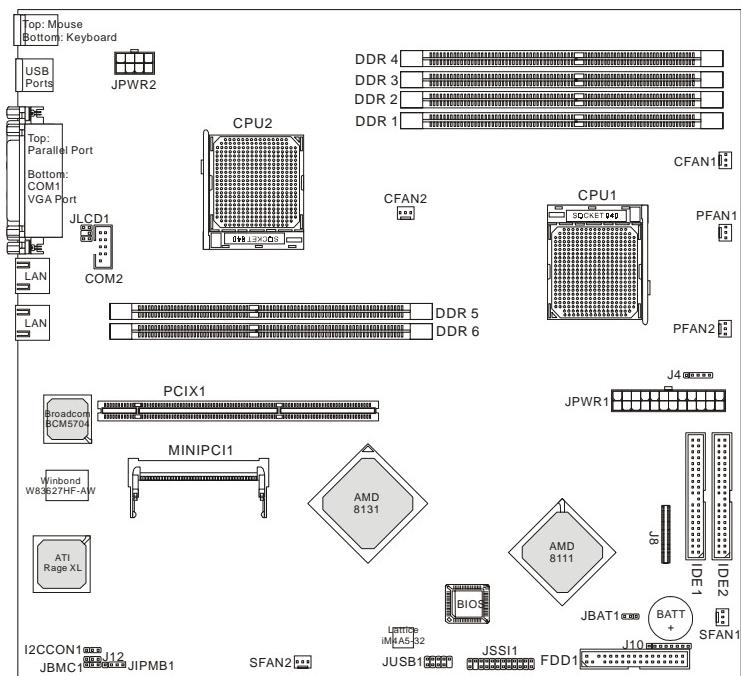
## ***Getting Started***

### **Mainboard Layout**



**K8D Master-F (MS-9131 v1.X) SSI Mainboard**

*MS-9131 SSI Mainboard*



K8D Master-FT (MS-9131 v1.X) SSI Mainboard

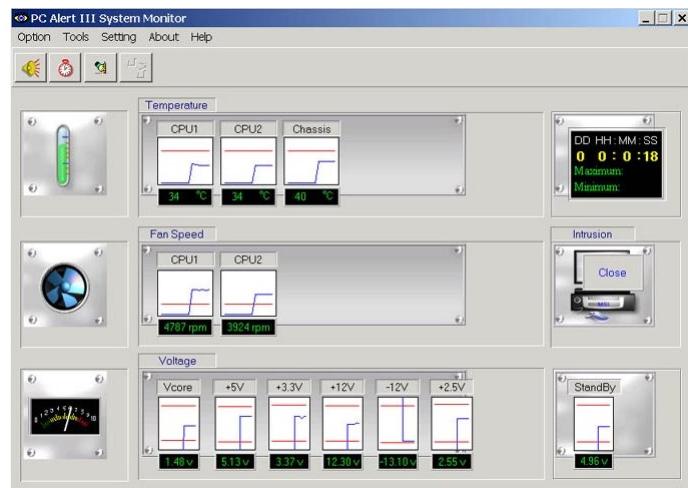
## MSI Special Features

### PC Alert™ III

The PC Alert™ III is a utility you can find in the CD-ROM disk. The utility is just like your PC doctor that can detect the following PC hardware status during real time operation:

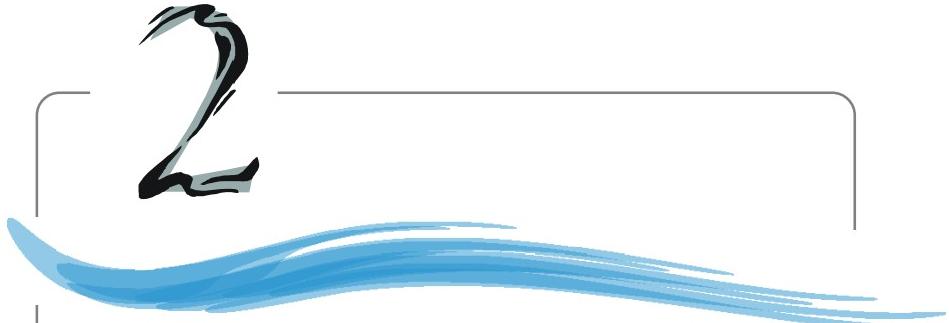
- ◆ monitor CPU & system temperatures
- ◆ monitor fan speed(s)
- ◆ monitor system voltage
- ◆ monitor chassis intrusion

If one of the items above is abnormal, the program main screen will be immediately shown on the screen, with the abnormal item highlighted in red. This will continue to be shown until user disables the warning.



#### MSI Reminds You...

1. Items shown on PC Alert™ III vary depending on your system status.
2. The mainboard bound with mBMC chip (Server Management Features) won't support PC Alert™ III.

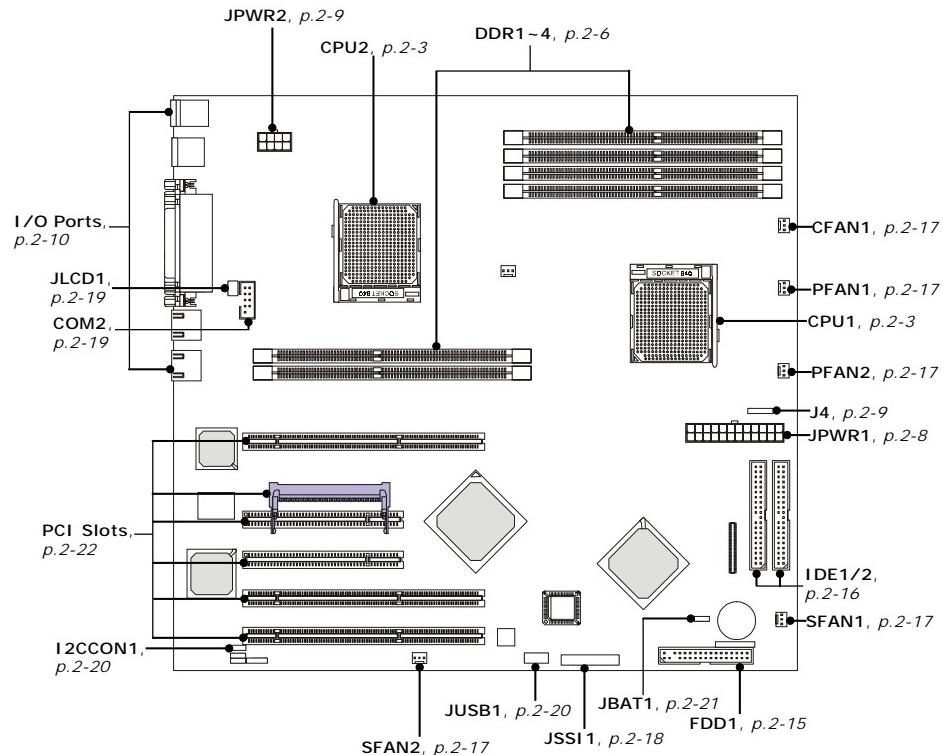


## ***Hardware Setup***

This chapter provides you with the information about hardware setup procedures. While doing the installation, be careful in holding the components and follow the installation procedures. For some components, if you install in the wrong orientation, the components will not work properly.

Use a grounded wrist strap before handling computer components. Static electricity may damage the components.

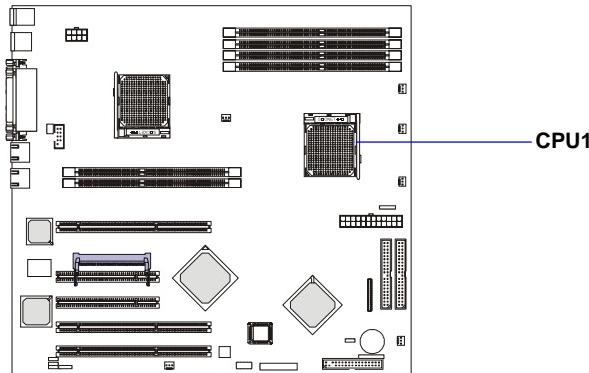
## Quick Components Guide



## Central Processing Unit: CPU

The mainboard supports **Single/Dual** AMD® Opteron DP™ processor(s). The mainboard uses two CPU sockets called Socket 940 for easy CPU installation. You can install SINGLE or DUAL CPUs on the mainboard to meet your own needs. Keep the following points in mind before installing CPU(s):

1. If **SINGLE** CPU is intended, always install the CPU on the **CPU1** socket.



2. To install **DUAL** CPUs on the board, you must use **the same type of CPUs running at the same frequency**.



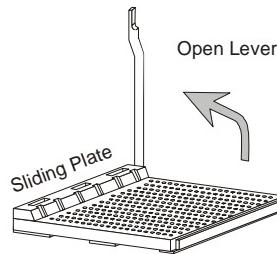
### WARNING! Thermal Issue for CPU

As processor technology pushes to faster speeds and higher performance, thermal management becomes increasingly crucial when building computer systems. Maintaining the proper thermal environment is key to reliable operation. As such, the processor must be maintained in the specified thermal requirements.

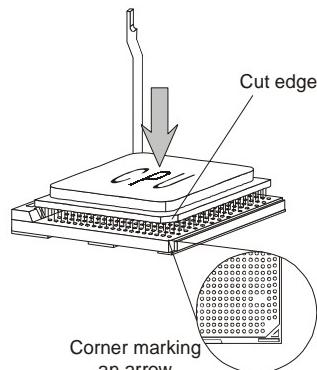
AMD Athlon™/Duron™/Athlon™ XP processor with a speed of **600MHz and above** requires a **LARGER** heatsink and fan. You also need to add thermal grease between the CPU and heatsink to improve heat dissipation. Then, make sure that the CPU and heatsink are securely fastened and in good contact with each other. These are needed to prevent damaging the processor and ensuring reliable operation. If you want to get more information on the proper cooling, you can visit AMD's website for reference.

### CPU Installation Procedures for Socket 940

1. Make sure that the computer is turned off, and the power cord disconnected before installing the CPU.



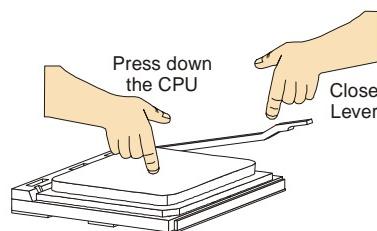
2. Pull the lever sideways away from the socket, and raise it up to a 90-degree angle.



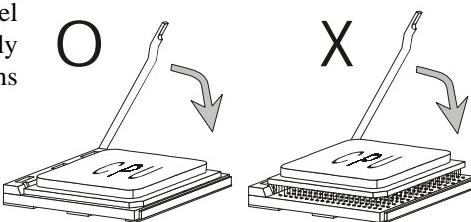
3. Locate the cut edge of the CPU. When the CPU is installed into the socket, this cut edge should be aligned with the corner marking an arrow on the Socket 940.

Please note that the CPU can only fit in a correct orientation, **DO NOT** use force to install the CPU into the socket.

4. Place the CPU onto the socket and press it down firmly into the socket. The pins of the CPU should be embedded into the socket completely.

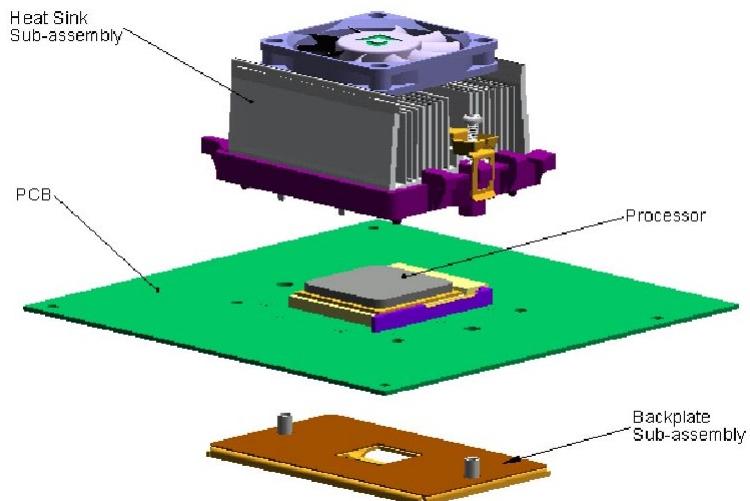


5. Close the lever to secure the CPU. Do not close the lever until the CPU's pins are fully inserted; otherwise, the pins may be damaged.



### **Installing AMD Opteron DP™ CPU Cooling System**

*When you are installing the CPU, make sure the CPU has a heat sink and a cooling fan attached on the top to prevent overheating. If you do not find the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.*



reference figure



#### **MSI Reminds You...**

##### **Overheating**

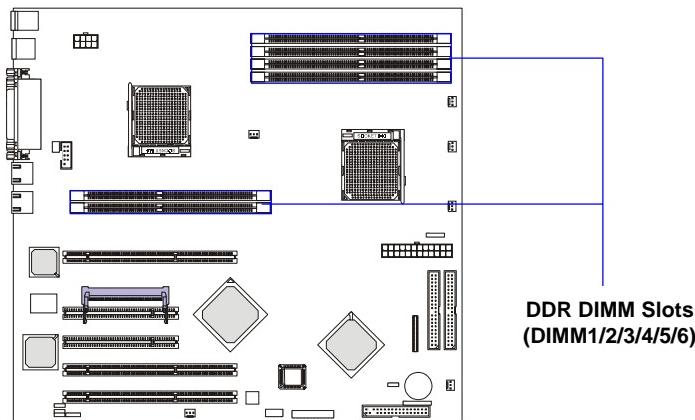
*Overheating will seriously damage the CPU and system, always make sure the cooling fan can work properly to protect the CPU from overheating.*

##### **Replacing the CPU**

*While replacing the CPU, always turn off the ATX power supply or unplug the power supply's power cord from grounded outlet first to ensure the safety of CPU.*

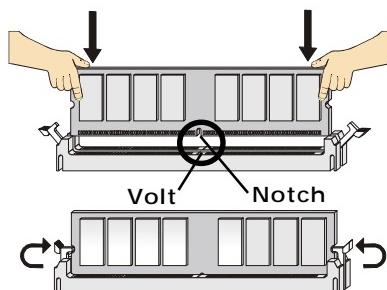
## Memory

The mainboard provides six slots for 184-pin DDR SDRAM DIMM (Double In-Line Memory Module) modules and supports up to 12GB memory size. You can install PC2700/DDR333, PC2100/DDR266, or PC1600/DDR200 modules on the DDR DIMM slots (DIMM 1~6).



### Installing DDR Modules

1. The DDR DIMM has only one notch on the center of module. The module will only fit in the right orientation.
2. Insert the DIMM memory module vertically into the DIMM slot. Then push it in until the golden finger on the memory module is deeply inserted in the socket.
3. The plastic clip at each side of the DIMM slot will automatically close.



### **Memory Population Rules**

The mainboard supports DDR333/266/200 memory interface.

Each DIMM slot supports up to a maximum size of 2GB. Users can install either single- or double-sided modules depending on their needs.

Memory modules can be installed in any combination as follows:

Slot	Memory Module Population Rules (Dual channel - 128 bits)						
DIMM 1	Install			Install		Install	Install
DIMM 2	Install			Install		Install	Install
DIMM 3		Install		Install	Install		Install
DIMM 4		Install		Install	Install		Install
DIMM 5			Install		Install	Install	Install
DIMM 6			Install		Install	Install	Install

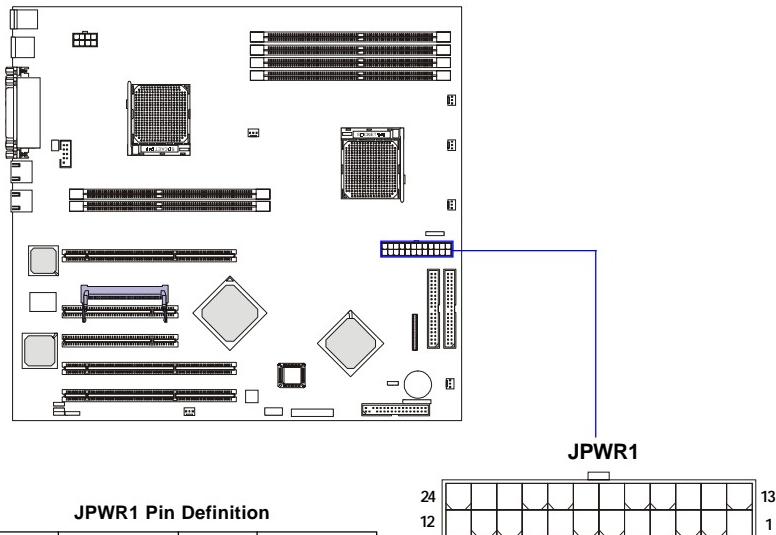
Slot	Memory Module Population Rules (Single channel - 64 bits)						
DIMM 1							
DIMM 2	Install			Install		Install	Install
DIMM 3							
DIMM 4		Install		Install	Install		Install
DIMM 5							
DIMM 6			Install		Install	Install	Install

## Power Supply

The mainboard supports SSI power supply for the power system. Before inserting the power supply connector, always make sure that all components are installed properly to ensure that no damage will be caused.

### SSI 24-Pin Power Connector: JPWR1

This connector allows you to connect an SSI power supply. To connect the SSI power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.

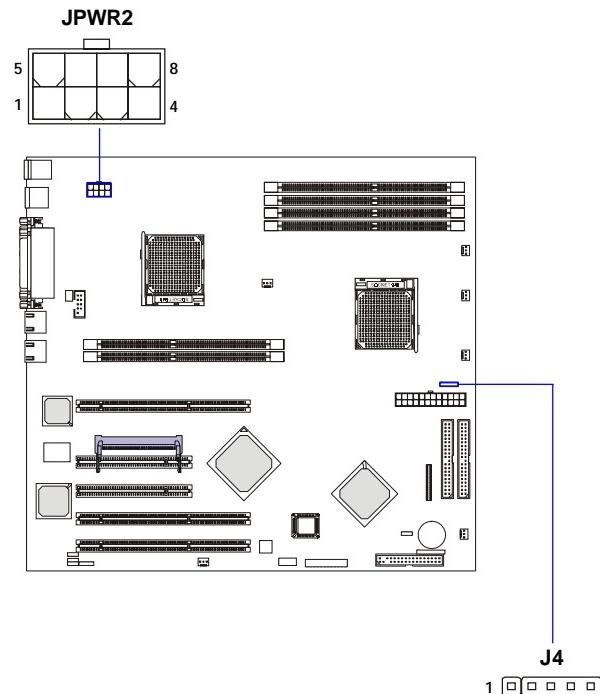


### **SSI 8-Pin Power Connector: JPWR2**

This connector is an optional power connector to provide 12V power output.

### **SSI 5-Pin Power Connector: J4**

This connector provides power supply to the System Management Bus (SMB).



**JPWR2 Pin Definition**

PIN	SIGNAL	PIN	SIGNAL
1	GND	5	+12V
2	GND	6	+12V
3	GND	7	+12V
4	GND	8	+12V

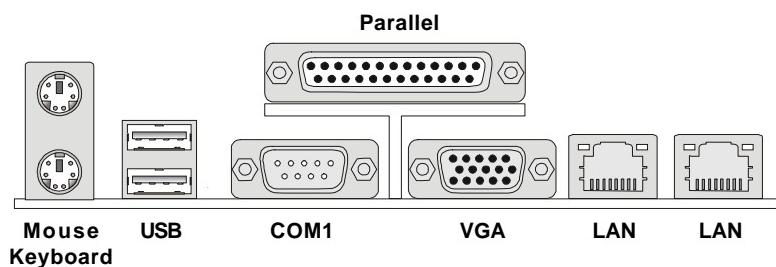
**J4 Pin Definition**

PIN	SIGNAL
1	SMB clock
2	SMB data
3	PS alert
4	GND
5	3.3RS

## Back Panel

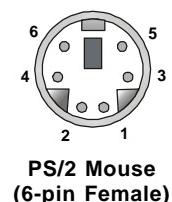
### View of the Back Panel

The back panel provides the following connectors:



### Mouse Connector

The mainboard provides a standard PS/2® mouse mini DIN connector for attaching a PS/2® mouse. You can plug a PS/2® mouse directly into this connector. The connector location and pin assignments are as follows.



Pin Definition

PIN	SIGNAL	DESCRIPTION
1	Mouse Data	Mouse data
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Mouse Clock	Mouse clock
6	NC	No connection

### **Keyboard Connector**

The mainboard provides a standard PS/2® keyboard mini DIN connector for attaching a PS/2® keyboard. You can plug a PS/2® keyboard directly into this connector. The connector location and pin assignments are as follows.

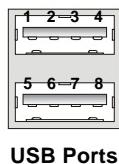


Pin Definition		
PIN	SIGNAL	DESCRIPTION
1	Keyboard Data	Keyboard data
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	KeyboardClock	Keyboard clock
6	NC	No connection

---

### **USB Ports**

The mainboard provides a UHCI (Universal Host Controller Interface) Universal Serial Bus root for attaching USB devices such as keyboard, mouse or other USB-compatible devices. You can plug USB devices directly into the ports.

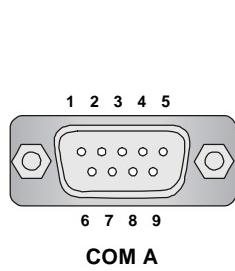


Pin Definition		
PIN	SIGNAL	DESCRIPTION
1	VCC	+5V
2	-Data 0	Negative Data Channel 0
3	+Data 0	Positive Data Channel 0
4	GND	Ground
5	VCC	+5V
6	-Data 1	Negative Data Channel 1
7	+Data 1	Positive Data Channel 1
8	GND	Ground

### **MS-9131 SSI Mainboard**

#### **Serial Port: COM 1**

The mainboard provides one 9-pin male DIN connector as serial port COM A. The serial port is a 16550A high speed communication port that sends/receives 16 bytes FIFOs. You can attach a serial mouse or other serial device directly to it.



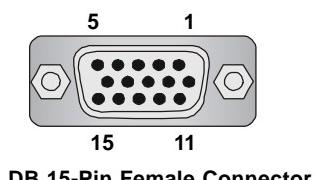
**Pin Definition**

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carry Detect
2	SIN	Serial In or Receive Data
3	SOUT	Serial Out or Transmit Data
4	DTR	Data Terminal Ready
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicate

---

#### **VGA DB 15 Pin Connector**

One DB 15-pin VGA connector is provided for connection to a VGA monitor.

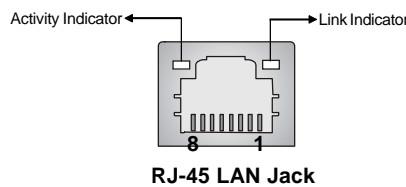


**Pin Definition**

Analog Video Display Connector (DB-15S)	
PIN	SIGNAL DESCRIPTION
1	Red
2	Green
3	Blue
4	Not used
5	Ground
6	Ground
7	Ground
8	Ground
9	Power
10	Ground
11	Not used
12	SDA
13	Horizontal Sync
14	Vertical Sync
15	SCL

### **RJ-45 LAN Jack: Giga-bit LAN**

The mainboard provides two standard RJ-45 jacks for connection to Local Area Network (LAN). Giga-bit LAN enables data to be transferred at 1000, 100 or 10Mbps. You can connect a network cable to either LAN jack.



**RJ-45 LAN Jack**

The pin assignments vary depending on the transfer rates: 10/100Mbps or 1000Mbps. Note that Pin 1/2, 3/6, 4/5, 7/8 must work in pairs. Please refer to the following for details:

**10/100 LAN Pin Definition**

PIN	SIGNAL	DESCRIPTION
1	TDP	Transmit Differential Pair
2	TDN	Transmit Differential Pair
3	RDP	Receive Differential Pair
4	NC	Not Used
5	NC	Not Used
6	RDN	Receive Differential Pair
7	NC	Not Used
8	NC	Not Used

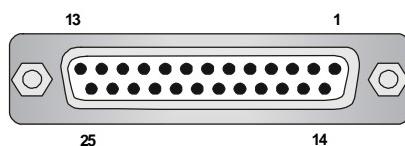
**Giga-bit LAN Pin Definition**

PIN	SIGNAL	DESCRIPTION
1	D0P	Differential Pair 0+
2	D0N	Differential Pair 0-
3	D1P	Differential Pair 1+
4	D2P	Differential Pair 2+
5	D2N	Differential Pair 2-
6	D1N	Differential Pair 1-
7	D3P	Differential Pair 3+
8	D3N	Differential Pair 3-

### **MS-9131 SSI Mainboard**

#### **Parallel Port**

The mainboard provides a 25-pin female centronic connector as LPT. A parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) mode.



**Pin Definition**

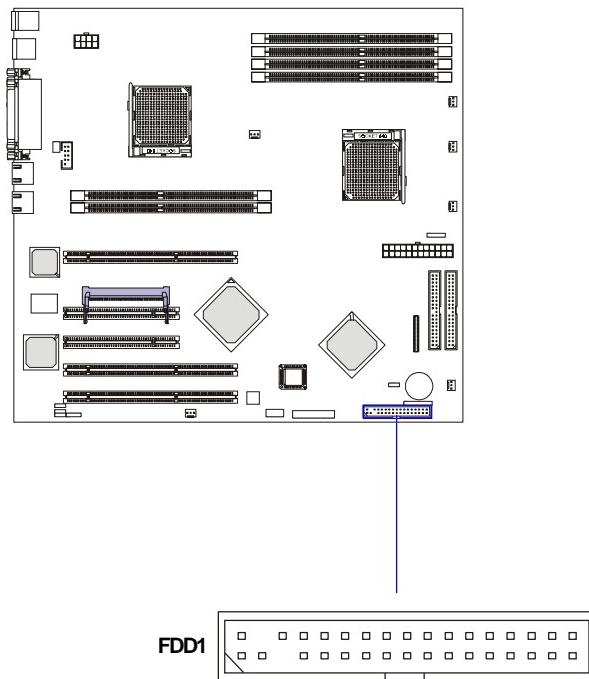
PIN	SIGNAL	DESCRIPTION
1	STROBE	Strobe
2	DATA0	Data0
3	DATA1	Data1
4	DATA2	Data2
5	DATA3	Data3
6	DATA4	Data4
7	DATA5	Data5
8	DATA6	Data6
9	DATA7	Data7
10	ACK#	Acknowledge
11	BUSY	Busy
12	PE	PaperEnd
13	SELECT	Select
14	AUTO FEED#	AutomaticFeed
15	ERR#	Error
16	INIT#	Initialize Printer
17	SLIN#	Select In
18	GND	Ground
19	GND	Ground
20	GND	Ground
21	GND	Ground
22	GND	Ground
23	GND	Ground
24	GND	Ground
25	GND	Ground

## Connectors

The mainboard provides connectors to connect FDD, IDE HDD, front panel of the system case, audio ports, USB Ports, and CPU/System FANs.

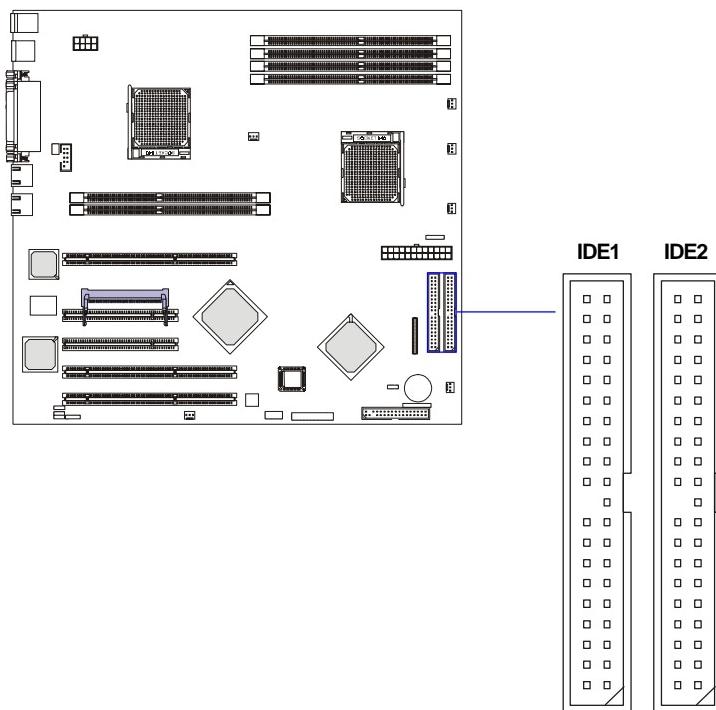
### Floppy Disk Drive Connector: FDD1

The mainboard provides a standard floppy disk drive connector that supports 360KB, 720KB, 1.2MB, 1.44MB and 2.88MB floppy disk types.



### Hard Disk Connectors: IDE1 & IDE2

The mainboard provides a 32-bit Enhanced PCI IDE and Ultra DMA 33/66/100/133 controller that supports PIO mode 0 ~ 4, Bus Master, and Ultra DMA 33/66/100/133 function. You can connect up to four hard disk drives, CD-ROM drives, 120MB floppy disk drive (reserved for future BIOS), and other devices.

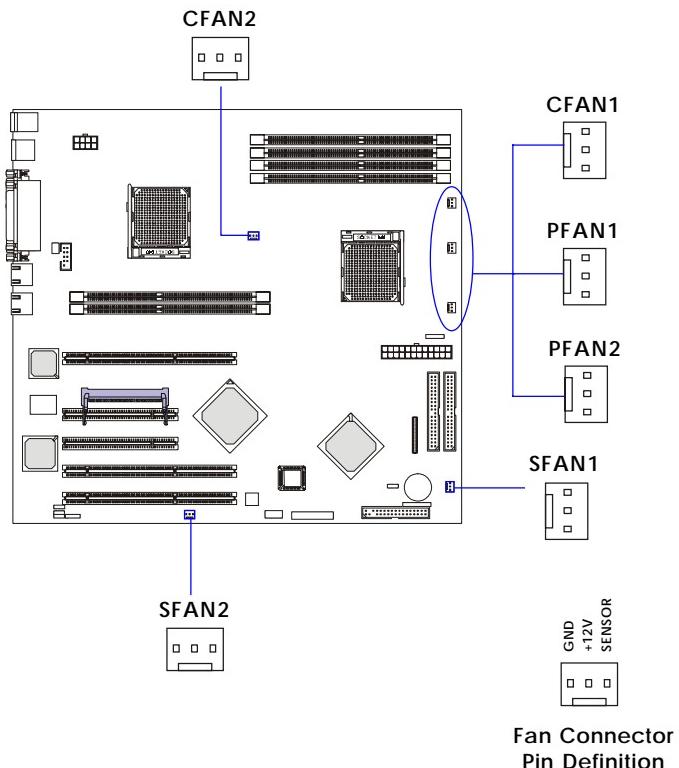


#### MSI Reminds You...

*If you install two hard disks on cable, you must configure the second drive to Slave mode by setting its jumper. Refer to the hard disk documentation supplied by hard disk vendors for jumper setting instructions.*

### **Fan Power Connectors: CFAN1/2, SFAN1/2, PFAN1/2**

The CAN1/2 (processor fan), SFAN1/2 (system fan) and PFAN1/2 (power fan) support system cooling fan with +12V. It supports 3-pin head connector. When connecting the wire to the connectors, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.

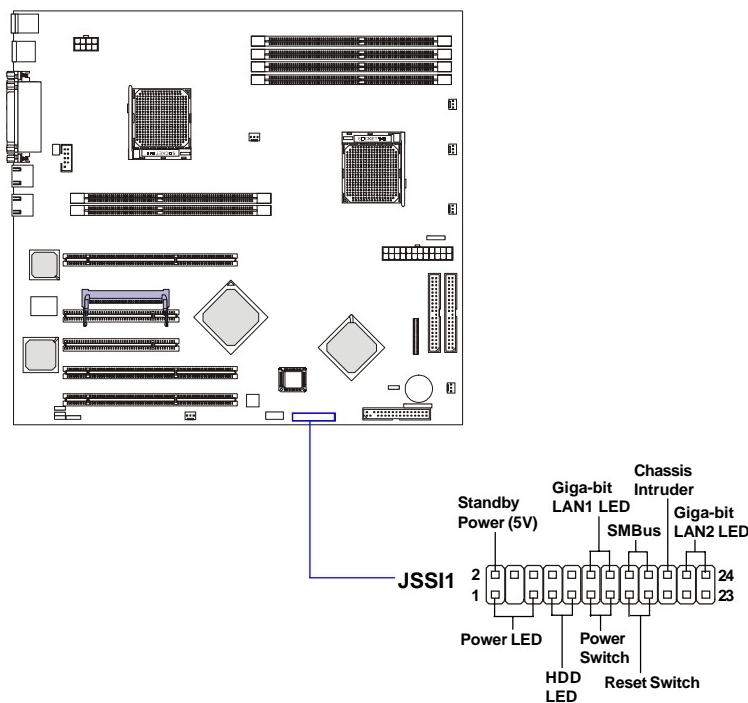


**MSI Reminds You...**

*Always consult the vendors for proper CPU cooling fan.*

## Front Panel Connector: JSSI1

The mainboard provides one front panel connector for electrical connection to the front panel switches and LEDs.

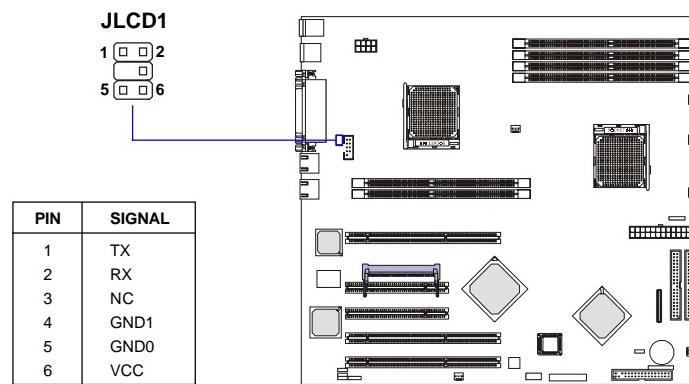


JSSI1 Pin Definition

Pin	Description	Pin	Description
1	Power LED +	2	5Vs/b
3	Key	4	No Connection
5	Power LED -	6	No Connection
7	HDD Activity LED +	8	System Status LED +
9	HDD Activity LED -	10	System Status LED -
11	Power Switch+ (GND)	12	NIC Activity LED +
13	Power Switch- (GND)	14	NIC Activity LED -
15	Reset Switch+	16	SMBus SDA
17	Reset Switch- (GND)	18	SMBus SCL
19	ACPI Sleep Switch	20	Chassis Intrusion
21	ACPI Sleep Switch (GND)	22	NIC#2 Activity LED +
23	NMI to CPU Switch	24	NIC#2 Activity LED -

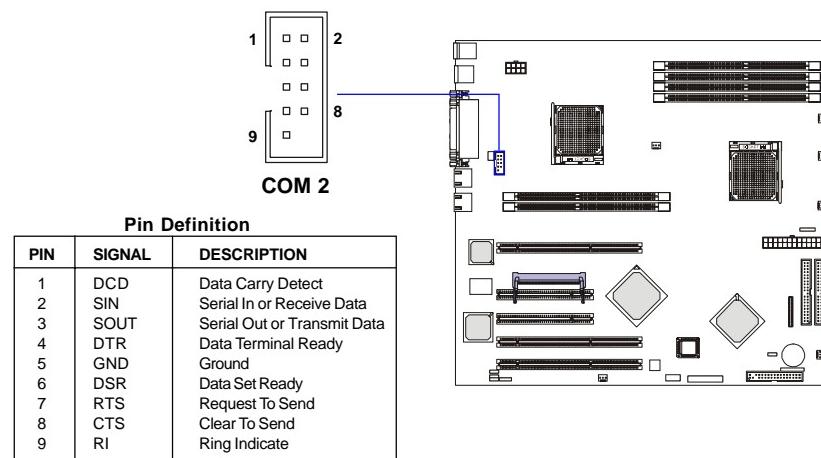
### LCD Panel Connector: JLCD1

The connector is additionally provided for connection to a LCD panel, which shows information on the panel for you to identify the current status or mode of the connected system.



### Serial Port Connector: COM 2

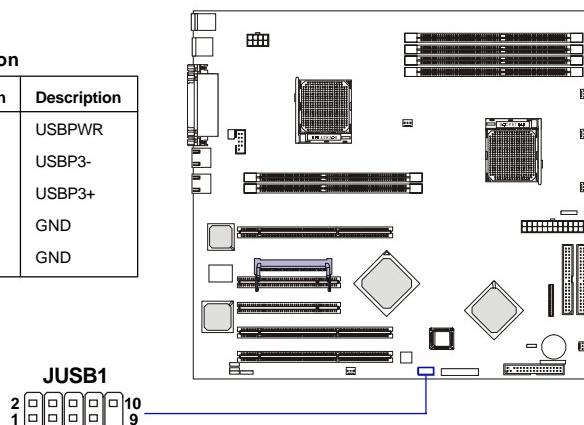
The mainboard provides one 9-pin header as serial port COM 2. The port is a 16550A high speed communication port that sends/receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to it.



### Front USB Connector: JUSB1

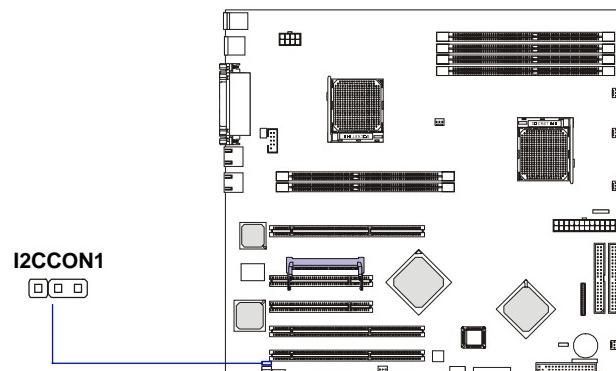
The mainboard provides one front Universal Serial Bus connector for users to connect to USB ports.

Pin Definition			
Pin	Description	Pin	Description
1	USBPWR	2	USBPWR
3	USBP2-	4	USBP3-
5	USBP2+	6	USBP3+
7	GND	8	GND
9	NC	10	GND



### I2C Bus Connector: I2CCON1

The mainboard provides one I2C (also known as I<sup>2</sup>C) Bus connector for users to connect to System Management Bus (SMBus) interface.

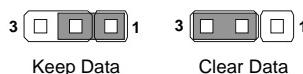
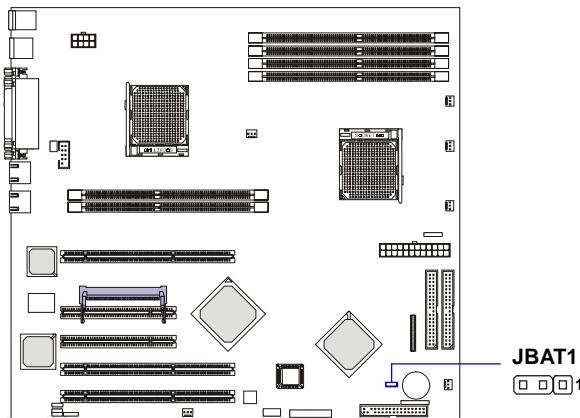


## Jumpers

The mainboard provides the following jumpers for you to set the computer's function. This section will explain how to change your mainboard's function through the use of jumpers.

### Clear CMOS Jumper: JBAT1

There is a CMOS RAM on board that has a power supply from external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, use the JBAT1 (Clear CMOS Jumper ) to clear data. Follow the instructions below to clear the data:

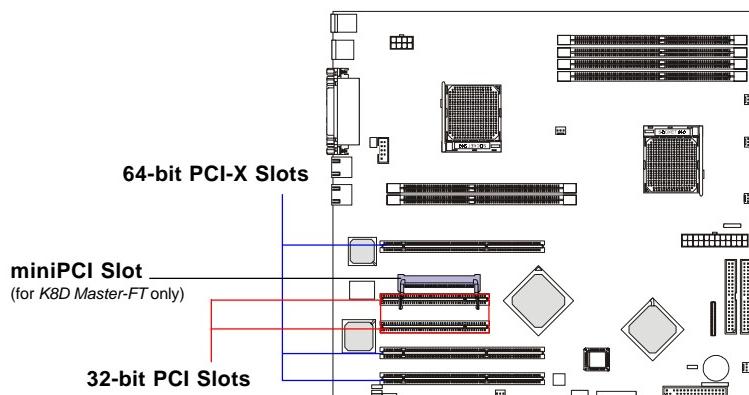


#### MSI Reminds You...

*You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.*

## Slots

The **K8D Master-F** mainboard provides three 64-bit/100 MHz PCI-X slots and two 32-bit/33 MHz PCI slots. The **K8D Master-FT** mainboard provides one 64-bit/100 MHz PCI-X slot and one miniPCI slot.



### PCI (Peripheral Component Interconnect) Slots

The PCI slots allow you to insert the expansion cards to meet your needs. When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to make any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration. The mainboard provides three Master 64-bit PCI (also called *PCI-X*) bus slots and two 32-bit PCI slots.

**64-bit PCI-X bus:** The bus has 64 data lines and runs at 33,66, or 100 MHz. With twice data lines and much faster PCI clock, the 64-bit PCI-X bus increases increases the throughput and overall system performance.

**32-bit PCI bus:** The bus has 32 data lines and runs at 33 MHz.



#### MSI Reminds You...

*Mainboard photos shown in next section are for demonstration of the installation of miniPCI cards only. The appearance of your mainboard may vary depending on the model you purchase.*

**Mini PCI Slot (for K8D Master-FT only)**

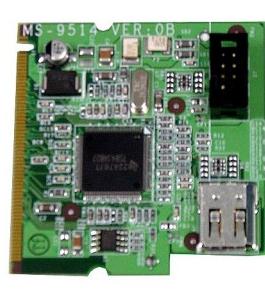
This slot is used to connect the optional MS-9518 SCSI card, MS-9513 VGA card, or MS-9514 IEEE 1394 card.



MS-9518 SCSI card



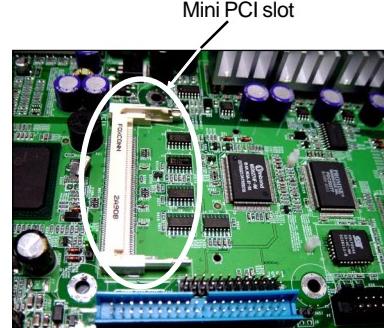
MS-9513 VGA card



MS-9514 IEEE1394 card

**Installing the card:**

1. Locate the Mini PCI slot on the mainboard.



2. Place the card over the Mini PCI slot and gently insert both ends of the card slantways (at an angle of 45 degrees) into the slot until the golden finger of the card gets fully inserted into the slot.

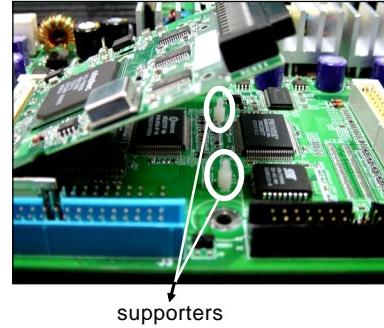


**MSI Reminds You...**

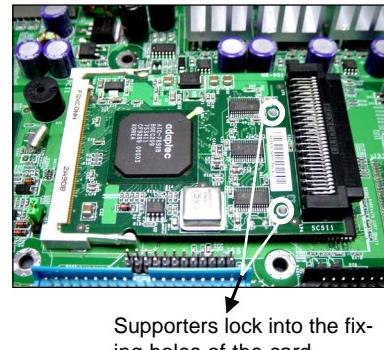
*You can barely see the golden finger if the card is properly inserted in the socket.*

### **MS-9131 SSI Mainboard**

3. Locate the supporters on the mainboard (one on the right end and the other on the left end).



4. Align the two fixing holes on the card with the supporters and press the card carefully down until the fixing holes get locked by the supporters.



5. Push the retaining clips (on two ends of the slot) inwards until they lock onto the notches in the ends of the card. The card should securely fit into the slot.



**Removing the card:**

1. Gently push the retaining clips outwards. Hold the card lightly but firmly. Use long nose pliers to clip one of the supporters and press it downwards until it withdraws from the fixing hole.



2. Clip the other supporter and press it downwards until it withdraws from the fixing hole.



3. The card will automatically bound upwards after being released from the supporters.



4. Remove the card from the Mini PCI slot.



### **PCI Interrupt Request Routing**

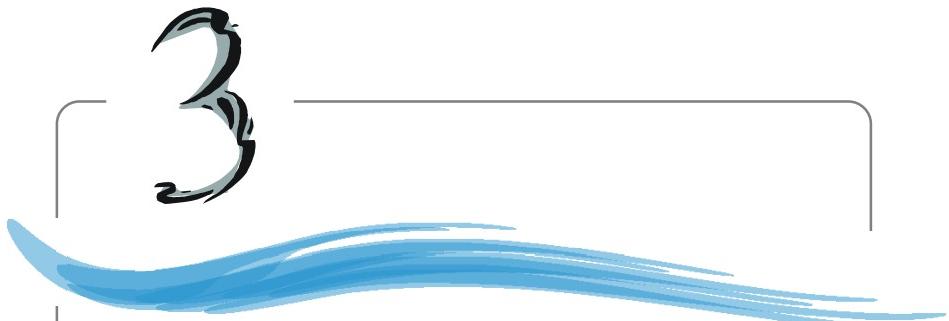
The IRQ, acronym of interrupt request line and pronounced I-R-Q, are hardware lines over which devices can send interrupt signals to the microprocessor. The PCI IRQ pins are typically connected to the PCI bus INT A# ~ INT D# pins as follows:

**PCI-32 IRQ Routing**

PCI-32 Device	INT A#	INT B#	INT C#	INT D#
ATI VGA	C			
MiniPCI	D			
PCI Slot1	A	B	C	D
PCI Slot2	B	C	D	A

**PCI-64 IRQ Routing**

PCI-X Device	INT A#	INT B#	INT C#	INT D#
PCIX1 (Bridge B)	A	B	C	D
LAN (Bridge B)	B	C		
PCIX2 (Bridge A)	A	B	C	D
PCIX3 (Bridge A)	B	C	D	A



## ***BIOS Setup***

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use. You may need to run the Setup program when:

- ❖ An error message appears on the screen during the system booting up, and requests you to run SETUP.
- ❖ You want to change the default settings for customized features.

## Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <DEL> key to enter Setup.

DEL: Setup F8: Boot Menu F12: Network boot TAB: Logo

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

### Selecting the First Boot Device

You are allowed to select the 1st boot device without entering the BIOS setup utility by pressing <F8>. When the same message as listed above appears on the screen, press <F8> to trigger the boot menu.

The POST messages might pass by too quickly for you to respond in time. If so, restart the system and press <F8> after around 2 or 3 seconds to activate the boot menu similar to the following.

Select First Boot Device		
Floppy	:	1st Floppy
IDE-0	:	IBM-DTLA-307038
CDROM	:	ATAPI CD-ROM DRIVE 40X M
[Up/Dn] Select	[RETURN] Boot	[ESC] cancel

The boot menu will list all the bootable devices. Select the one you want to boot from by using arrow keys and then pressing <Enter>. The system will boot from the selected device. The selection will not make changes to the settings in the BIOS setup utility, so next time when you power on the system, it will still use the original first boot device to boot up.

## **Control Keys**

<<-->>	Select Screen
<↑><↓>	Select Item
<Enter>	Go to Sub Screen
<F1>	General Help
<F7>	Discard Changes
<F8>	Load Failsafe Defaults
<F9>	Load Optimal Defaults
<F10>	Save Changes and Exit
<ESC>	Discard Changes and Exit

## **Getting Help**

After entering the Setup utility, the first screen you see is the Main Menu.

### **Main Menu**

The main menu displays the setup categories the BIOS supplies. You can use the arrow keys (↑↓) to select the item. The on-line description for the selected setup category is displayed at the bottom of the screen.

### **Default Settings**

The preset BIOS Setup Defaults of the BIOS setup program provide optimal performance settings for all devices and the system.

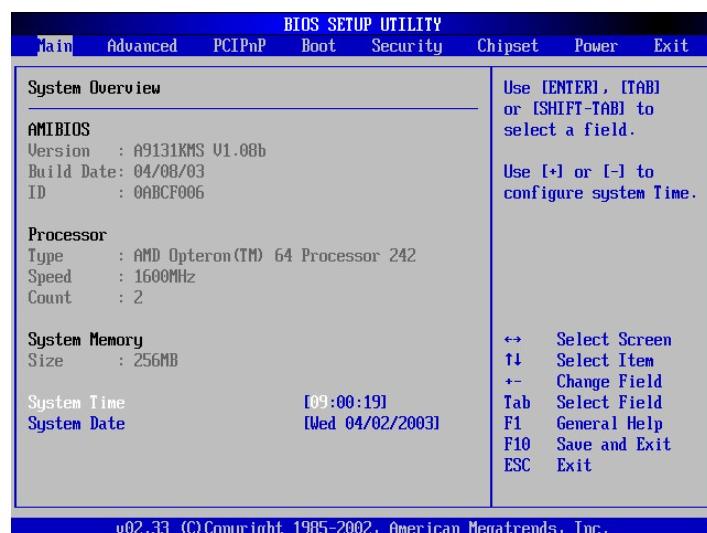


#### **MSI Reminds You...**

*The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.*

## The Setup Categories

Once you enter AMI BIOS SETUP UTILITY, the Main Menu will appear on the screen. On the Main Menu screen, you will see basic CMOS settings including system time & date, and the setup categories the BIOS supplies. Use Arrow keys to move among the items and menus, and make changes to the settings.



### Main

Use this menu for basic system configurations, such as time, date etc.

### Advanced

Use this menu to setup the items of AMI® special enhanced features, such as the power-on state, storage devices configuration and system hardware monitoring... etc.

### PCI PnP

This menu allows you to configure the PnP (Plug & Play) devices in your system and assign the system resources like IRQs & DMAs.

### Boot

Use this menu to specify the priority of boot devices.

**Security**

Use this menu to set Supervisor and User Password.

**Chipset**

Use this menu to change the values in the chipset registers and optimize your system's performance.

**Power**

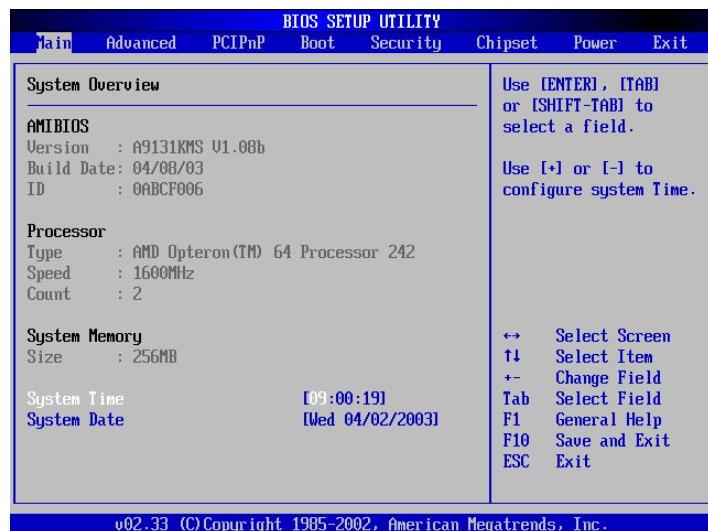
Use this menu to specify your settings for power management.

**Exit**

This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.

## Main

The items inside the Main menu are for basic system information and configuration. Each item includes none, one or more setup items. Use the Up/Down arrow keys or <Tab> to highlight the item or field you want to modify and use the <+> or <-> key to switch to the value you prefer.



### System Time

The time format is <hour> <minute> <second>.

### System Date

The date format is <day><month> <date> <year>.

**day** Day of the week, from Sun to Sat, determined by BIOS. Read only.

**month** The month from Jan. through Dec.

**date** The date from 1 to 31 can be keyed by numeric function keys.

**year** The year, depends on the year of the BIOS

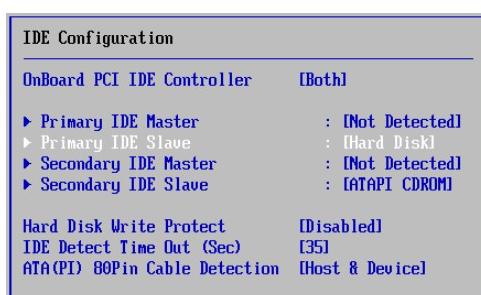
## Advanced

Items in the menu are divided into 6 sub-menus. Each sub-menu provides more settings. To enter the sub-menu, highlight the sub-menu you want to configure and press <Enter>.



### IDE Configuration

The sub-menu configures the attached IDE devices.



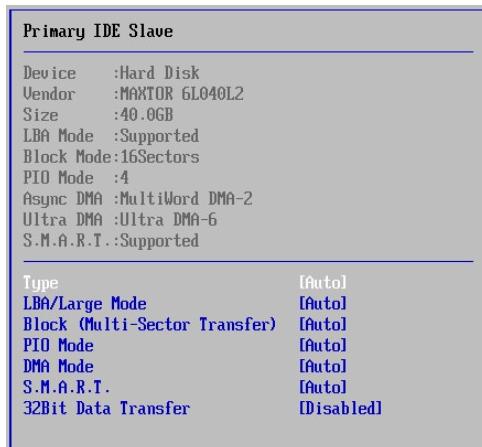
#### OnBoard PCI IDE Controller

This setting allows you to set the onboard PCI IDE controller. Setting

options: Disabled, Primary, Secondary, Both. Choosing *Disabled* will disable the integrated IDE controller. Choosing *Primary* will enable only the primary IDE controller. Choosing *Secondary* will enable only the secondary IDE controller. Choosing *Both* will enable both IDE controllers.

#### **Primary/Secondary IDE Master/Slave**

The settings allow you to configure each IDE device individually. Press <Enter> to go to the sub-menu, and a sub-menu screen similar to the following picture will appear.



#### **Device, Vendor, Size, LBA/Block/PIO Mode, Async/Ultra DMA, S.M.A.R.T.**

These settings display basic information and specification of the detected IDE device.

Device	Type of the device.
Vendor	Model number of the device.
SIZE	Capacity of the device.
LBA/Large Mode	Indicates whether the LBA (Logical Block Addressing) or Large mode is supported by the device.
Block Mode	Indicates the optimal number of sectors read/

PIO Mode	writes for every block transfer.
Async DMA	Indicates the PIO modes the drive supports.
Ultra DMA	Indicates the type of Async DMA.
S.M.A.R.T.	Indicates the type of Ultra DMA.
	Indicates whether Self-Monitoring, Analysis and Reporting Technology is supported.

**Type**

This setting allows you to set the type of IDE devices installed. Setting options: Not Installed, Auto, CDROM, ARMD.

**LBA/Large Mode**

This setting allows you to set the LBA/Large mode. Setting options: Disabled, Auto. Choosing *Auto* will enable LBA mode if the device supports it and the device is not already formatted with LBA mode disabled.

**Block Mode**

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select *Auto* for automatic detection of the optimal number of block read/writes per sector the drive can support. Setting options: Disabled, Auto. Choosing *Disabled*, the data transfer from and to the device occurs only one sector at a time.

**PIO Mode**

This is the PIO mode setting for the IDE device. IDE/ATA uses one of two different ways to transfer information into and out of memory: either programmed I/O (PIO) or direct memory access (DMA). There are 5 different PIO modes, from 0 to 4, with 4 being the fastest. Setting options: Auto, 0, 1, 2, 3, 4.

**DMA Mode**

This setting allows you to set the DMA mode. Setting options: Auto, SWDMA0~SWDMA2, MWDMA0~MWDMA2, UDMA0~UDMA4. Choosing *Auto*, the system will automatically detect the DMA mode. SWDMA refers to SingleWord DMA; MWDMA refers to MultiWord DMA; UDMA refers to Ultra DMA.

#### **S.M.A.R.T.**

This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S.M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before it becomes offline. Setting options: *Auto*, *Enabled*, *Disabled*.

#### **32Bit Data Transfer**

Enabling this setting allows for 32-bit data transfers between the processor and the PCI bus. Actual transfers to the disk are always done 16 bits at a time, but enabling this option will cause a small performance improvement on the transfer from the bus to the processor. Setting options: *Disabled*, *Enabled*.

#### **ARMD Emulation Type**

This setting allows you to select the ARMD device emulation type by BIOS. Setting options: *Auto*, *Floppy*, *Hard Disk*.

#### **Hard Disk Write Protect**

This setting is to set the Virus Warning feature for IDE Hard Disk boot sector protection. When *Enabled*, BIOS will issue a virus warning message and beep if a write to the boot sector or the partition table of the HDD is attempted. This will be effective only if the device is accessed through BIOS. Setting options: *Disabled*, *Enabled*.

*Note:* This feature only protects the boot sector, not the whole hard disk.

#### **IDE Detect Time Out (Sec)**

The setting allows you to select the time out value for detecting IDE devices. Settings options: *2.0x*, *2.5x*, *3.0x*, *3.5x*, *0*, *5*, *10*, *15*.

#### **ATA(PI) 80Pin Cable Detection**

The setting allows you to select the mechanism for detecting 80pin ATA (PI) cable. Setting options: *Host & Device*, *Host*, *Device*.

#### **SuperIO Configuration**

The sub-menu is used to configure serial and parallel ports.

Configure Win627 Super IO Chipset	
Floppy A	[1.44 MB 3½"]
Serial Port1 Address	[3F8/IRQ4]
Serial Port2 Address	[2F8/IRQ3]
Serial Port2 Mode	[Normal]
Parallel Port Address	[378]
Parallel Port Mode	[Normal]
Parallel Port IRQ	[IRQ7]
Chassis INFO Function	[Disabled]

### **Floppy A**

This setting specifies the type of floppy drive connected to the system.

### **Serial Port1 Address, Serial Port2 Address**

These settings specify the base I/O port addresses of the onboard Serial Port 1 (COM 1)/Serial Port 2 (COM 2). Available options for I/O port address are *Disabled*, 3F8, 2F8, 3E8 and 2E.

### **Serial Port2 Mode**

This setting allows you to specify the operation mode for serial port 2. Setting options: *IrDA*, *ASKIR*, *Normal*.

Normal	RS-232C Serial Port
IrDA	IrDA-compliant Serial Infrared Port
ASKIR	Amplitude Shift Keyed Infrared Port

### **Parallel Port Address**

This setting specifies the base I/O port address of the onboard parallel port. Settings are 378, 278, 3BC and *Disabled*.

### **Parallel Port Mode**

This setting selects the operation mode for the onboard parallel port: *Normal*, *Bi-Directional*, *EPP* (Enhanced Parallel Port), or *ECP* (Extended Capability Port).

### **Parallel Port IRQ**

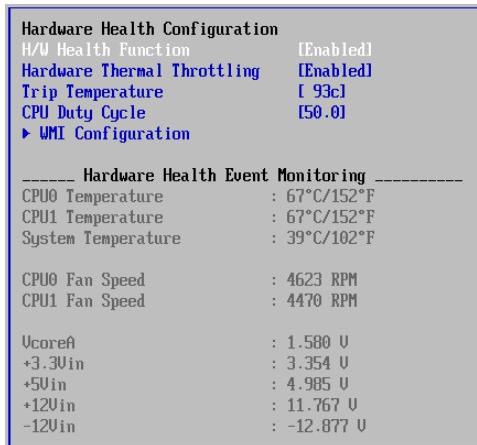
The setting specifies the IRQ for the onboard parallel port. Settings are 5 and 7.

### **Chassis Info Function**

This setting allows BIOS to enable/disable chassis checked function.

### **Hardware Health Configuration**

The sub-menu is used to configure system hardware monitoring features and display the current status of the system, such as system temperature, all fans' speeds,... and etc.



### **H/W Health Function**

This setting enables Hardware Health Monitoring Device.

### **Hardware Thermal Throttling**

Thermal Throttling allows the user to reduce the CPU duty cycle to a user defined percentage when the temperature reaches a user defined value.

### **Trip Temperature**

This setting controls the trip temperature to prevent the system from overheating.

### **CPU Duty Cycle**

This setting controls the CPU duty cycle.

### **WMI Configuration**

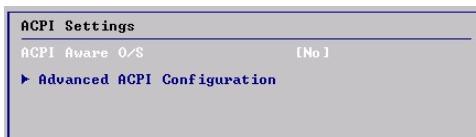
This setting configures the WMI interface.

### **CPU0/CPU1/System Temperature, CPU0/CPU1 Fan Speed, VcoreA, +3.3V in, +5V in, +12V in, -12V in**

These items display the current status of the system, including system & CPU temperatures, fans speeds, and CPU voltages etc.

### **ACPI Configuration**

The sub-menu shows the ACPI (Advanced Configuration and Power Interface) configuration options.

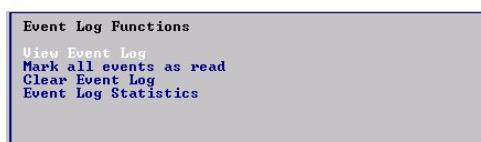


#### **ACPI Aware O/S**

This setting is used to activate the ACPI (Advanced Configuration and Power Management Interface) Function. If your operating system is ACPI-aware, such as Windows 98SE/2000/ME, select *Yes*. Setting options: *Yes*, *No*.

### **Event Log Control**

The sub-menu is used to configure the event logging function.



#### **View Event Log**

This setting allows the BIOS to display the unread events from the event log area. For example, CMOS Battery Failure, CMOS System Options Not Set,...etc.

#### **Mark All Events As Read**

This setting will enable the BIOS to mark all events in the event log area as read.

### **Clear Event Log**

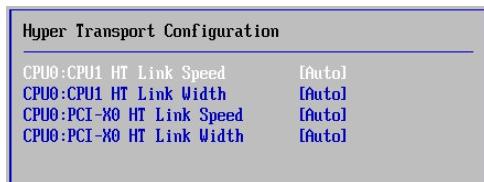
This setting discards all events in the event log.

### **Event Log Statistics**

This setting shows event log statistics.

### **Hyper Transport Configuration**

This setting configures HyperTransport links.



#### **CPU0:CPU1 HT Link Speed, CPU0:PCI-X0 HT Link Speed**

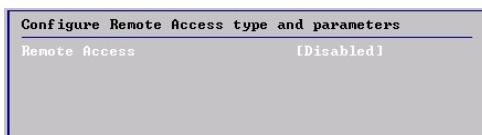
The Hyper Transport link will run at the specified speed if its actual speed is slower than or equal to the system clock. Note that this function will work only when your mainboard supports it. Setting to [Auto] the HT link will run at the maximum speed available.

#### **CPU0:CPU1 HT Link Width, CPU0:PCI-X0 HT Link Width**

The Hyper Transport link will run at the specified width. Setting to [Auto] the HT link will run at the maximum width available.

### **Remote Access Configuration**

The sub-menu controls the Remote Access type and the settings will vary depending on your hardware configuration.



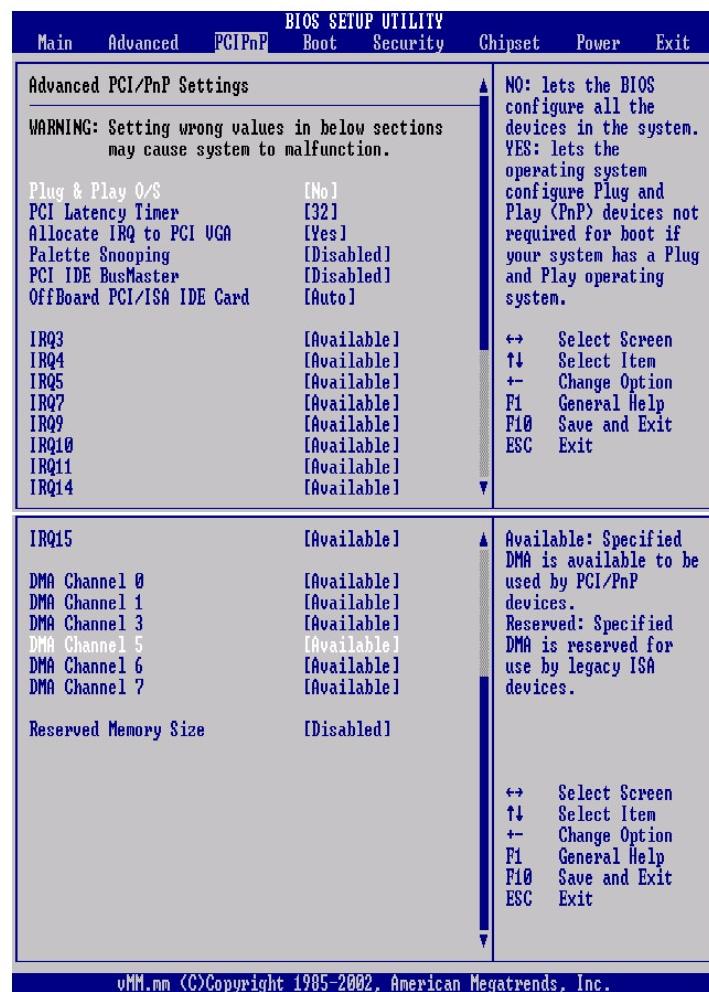
### **USB Configuration**

The sub-menu controls the USB host controllers.



## PCI PnP

This section describes configuring the PCI bus system. PCI, or Peripheral Component Interconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.



#### **Plug & Play O/S**

Selecting *Yes* will let the operating system configure PnP devices not required for boot if your system has a PnP OS. Selecting *No* will let the BIOS configure all the devices in the system.

#### **PCI Latency Timer**

This feature controls how long each PCI device can hold the bus before another takes over. The larger the value, the longer the PCI device can retain control of the bus. Setting options: 32, 64, 96, 128, 160, 192, 224, 248.

#### **Allocate IRQ to PCI VGA**

There are several settings in the PCI / PnP Configuration section of the BIOS program that deal with assigning interrupt resources. This includes both regular IRQs and the internal PCI interrupt resources. For most applications there is no need to manually select or deal with these resources; in this case the default setting of "Yes" should be selected, to enable automatic resource allocation. Setting options: *Yes*, *No*.

#### **Palette Snooping**

When set to *Enabled*, multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled). For example, if there are two VGA devices in the computer (one PCI and one ISA) and the:

VGA Palette Snoop Bit Setting	Action
<i>Disabled</i>	Data read or written by the CPU is only directed to the PCI VGA device's palette registers.
<i>Enabled</i>	Data read or written by the CPU is directed to both the PCI VGA device's palette registers and the ISA VGA device's palette registers, permitting the palette registers of both VGA devices to be identical.

The setting must be set to *Enabled* if any ISA bus adapter in the system requires VGA palette snooping.

#### **PCI IDE Bus Master**

The PCI bus also allows you to set up compatible IDE/ATA hard disk drives

to be bus masters. When PCI bus mastering is used, IDE/ATA devices use DMA modes to transfer data, increasing performance over the use of PIO modes, which are the default way that IDE/ATA hard disks transfer data to and from the system. Setting options: *Disabled*, *Enabled*.

**OffBoard PCI/ISA IDE Card**

This setting informs the PCI devices that an ISA graphics device is installed in the system so the card will function correctly.

**IRQ3/IRQ4/IRQ5/IRQ7/IRQ9/IRQ10/IRQ11/IRQ14/IRQ15 & DMA Channel 0/1/3/5/6/7**

When automatic resource allocation is not used, the BIOS allows you to specifically designate which system interrupts (IRQs) and direct memory access channels (DMAs) you want it to be able to use for setting up Plug and Play devices. For each IRQ or DMA, except ones reserved by the system, you can designate either "PCI/PnP" or "ISA/Legacy".

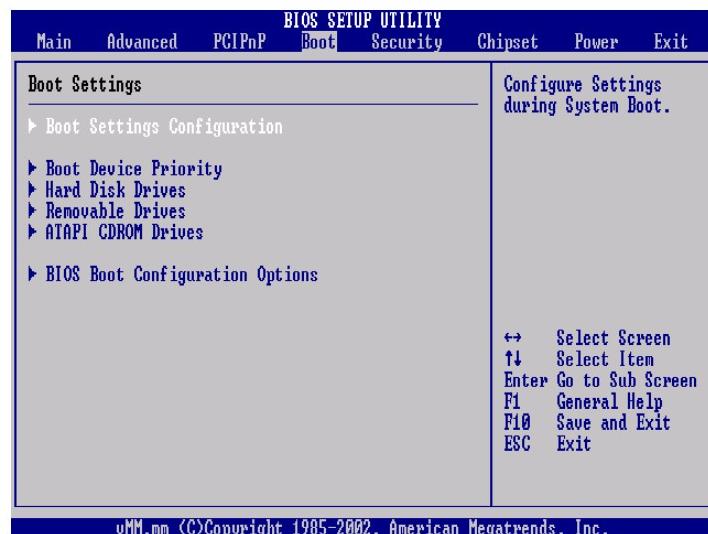
The IRQs that you can normally set here are IRQs 3, 4, 5, 7, 9, 10, 11, 14 and 15. The DMA channels are 0, 1, 3, 5, 6 and 7. (The others are reserved by system devices.) Setting options: *Available*, *Reserved*. *Available* represents that specified IRQ/DMA is available to be used by PCI/PnP. *Reserved* means that specified IRQ/DMA is reserved for use by Legacy ISA devices.

**Reserved Memory Size**

The item determines how much memory will be reserved for legacy ISA devices.

## Boot

The Boot menu is used to set the boot sequence of boot devices. To go to each item's sub-menu screen, highlight the item and press <Enter>.



### Boot Settings Configuration

The sub-menu configures the settings during system boot.

Boot Settings Configuration	
Quick Boot	[Disabled]
Quiet Boot	[Disabled]
AddOn ROM Display Mode	[Force BIOS]
Bootup Num-Lock	[Off]
PS/2 Mouse Support	[Disabled]
Typematic Rate	[Slow]
System Keyboard	[Absent]
Parity Check	[Disabled]
Boot To OS/2	[No]
Wait For 'F1' If Error	[Disabled]
Hit 'DEL' Message Display	[Disabled]
Interrupt 19 Capture	[Disabled]

#### Quick Boot

This setting allows BIOS to skip certain tests while booting. This will

decrease the time needed to boot the system. Setting options: *Disabled*, *Enabled*.

**Quiet Boot**

This setting allows you to decide whether or not to display POST messages during booting. Setting options: *Disabled*, *Enabled*. Choosing *Disabled*, the system will display normal POST messages during booting. Choosing *Enabled*, the system will display OEM Logo instead of POST messages during booting.

**AddOn ROM Display Mode**

This item is used to determine the display mode when an optional ROM is initialized during POST. Setting options: *Force BIOS*, *Keep Current*. When set to *Force BIOS*, the display mode used by AMI BIOS is used. Select *Keep Current* if you want to use the display mode of optional ROM.

**BootUp Num-Lock**

This feature controls the functionality of the Numeric Keyboard at boot up. If set to *On*, the Numeric Keyboard will function in the numeric mode (for typing out numbers) but if set to *Off*, it will function in the cursor control mode (for controlling the cursor). Setting options: *Off*, *On*.

**PS/2 Mouse Support**

This setting controls support for PS/2 mouse.

**Typematic Rate**

This setting controls the repeat rate for the keyboard when the typematic feature is activated. Setting options: *Slow*, *Fast*.

**System Keyboard**

This setting allows you to set the system keyboard. Setting options: *Absent*, *Present*.

**Parity Check**

When enabled, BIOS turns on parity checking for the system RAM. This should be enabled if you are using parity checking (or ECC), and disabled otherwise. Setting options: *Disabled*, *Enabled*.

*Note:* If you turn on parity checking on a system that does not have parity memory in it, the system will halt with a parity error as soon as it tries to boot up. If you turn off parity checking on a system that does have parity memory, the system will run just fine, but you will have no parity checking protection active.

#### **Boot To OS/2**

OS/2 differs from other operating systems (OS) in the way it manages the RAM. For systems running IBM's OS/2 operating system, select *Yes* and for systems running other operating systems, select *No*. Setting options: *No, Yes*.

#### **Wait For 'F1' If Error**

When the boot sequence encounters an error it asks you to press F1. Only at 'non-fatal' errors. If disabled, the system prints a warning and continues to boot without waiting for you to press any keys. *Enabled* recommended. *Disabled* if you want the system to operate as a server without a keyboard. Setting options: *Disabled, Enabled*.

#### **Hit 'DEL' Message Display**

This setting enables the system to display the **DEL** message ("Press DEL to run Setup") during the POST (Power On Self Test). Setting options: *Disabled, Enabled*.

#### **Interrupt 19 Capture**

This setting allows option ROMs to trap interrupt 19.

#### **Boot Device Priority**

The sub-menu specifies the Boot Device Priority sequence.

Boot Device Priority	
1st Boot Device	[1st FLOPPY DRIVE]
2nd Boot Device	[SS-ATAPI CD-ROM ]
3rd Boot Device	[PS-MAXTOR 6L040L2]
4th Boot Device	[IMBA v6.1.3 Slot 0]
5th Boot Device	[IMBA v6.1.3 Slot 0]

#### **1st/2nd/3rd/4th/5th Boot Device**

These settings specify the boot sequences of the available devices.

### **Hard Disk Drives**

The sub-menu assigns the boot priority of all hard disk drives installed in the system. If more than one hard disk drive are installed in the system, you will see more than one item appear on the screen, such as **2nd Hard Drive**, **3rd Hard Drive** etc. Then you can arrange the boot sequence of these hard disk drives.

Hard Disk Drives	
1st Drive	[N/A]
2nd Drive	[N/A]
3rd Drive	[N/A]
4th Drive	[N/A]
5th Drive	[N/A]
6th Drive	[N/A]
7th Drive	[N/A]
8th Drive	[N/A]
9th Drive	[N/A]
10th Drive	[N/A]
11th Drive	[N/A]
12th Drive	[N/A]

### **Removable Drives**

The sub-menu assigns the boot priority of all removable devices installed in the system. If more than one removable devices are installed in the system, you will see more than one item appear on the screen, such as **2nd Removable Dev**, **3rd Removable Dev** etc. Then you can arrange the boot sequence of these removable devices.

Removable Drives	
1st Drive	[N/A]
2nd Drive	[N/A]
3rd Drive	[N/A]
4th Drive	[N/A]

### **ATAPI CDROM Drives**

The sub-menu assigns the boot priority of all ATAPI CD-ROM drives installed in the system. If more than one ATAPI CD-ROM drives are installed in the system, you will see more than one item appear on the screen, such as **2nd ATAPI CDROM**, **3rd ATAPI CDROM** etc. Then you can arrange the boot order of these ATAPI CD-ROM drives.

ATAPI CDROM Drives	
1st Drive	[N/A]
2nd Drive	[N/A]
3rd Drive	[N/A]
4th Drive	[N/A]

## Security

This section lets you set security passwords to control access to the system at boot time and/or when entering the BIOS setup program. It also allows you to set virus protection at hard disk boot sector.



### Change Supervisor/User Password

Type the password, up to six characters in length, and press <Enter>. The password typed now will clear any previously set password from CMOS memory. You will be prompted to confirm the password. Retype the password and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To clear a set password, just press <Enter> when you are prompted to enter the password. A message will show up confirming the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup without entering any password.

When a password has been set, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.



**MSI Reminds You...**

***About Supervisor Password & User Password:***

*Supervisor password: Can enter and change the settings of the setup menu.*

*User password: Can only enter but do not have the right to change the settings of the setup menu.*

**Clear User Password**

Select *OK* to clear the user password or select *Cancel* to keep the user password.

**Boot Sector Virus Protection**

The item is to set the Virus Warning feature for IDE Hard Disk boot sector protection. When *Enabled*, BIOS will issue a virus warning message and beep if a write to the boot sector or the partition table of the HDD is attempted. Setting options are *Disabled* and *Enabled*.



**MSI Reminds You...**

*This feature only protects the boot sector, not the whole hard disk.*

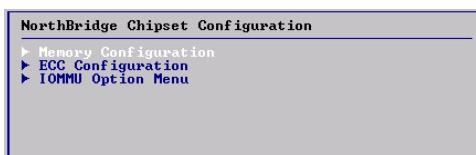
## Chipset

The Chipset Menu is used to change the values of the chipset registers. These registers control most of the system options in the computer.



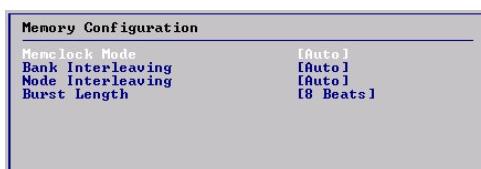
### NorthBridge Configuration

The sub-menu shows the configuration options for the NorthBridge chipset.



### Memory Configuration

The sub-menu controls onboard memory.



#### **Memclock Mode**

Memclock can be set by BIOS using *Auto*. If you select *Limit*, you can set one of the standard values.

#### **Bank/Node Interleaving**

Interleaving allows memory accesses to be spread out over BANKS on the same node, or across NODES, decreasing access contention.

#### **Burst Length**

This setting allows you to set the size of Burst-Length for DRAM. Bursting feature is a technique that DRAM itself predicts the address of the next memory location to be accessed after the first address is accessed. To use the feature, you need to define the burst length, which is the actual length of burst plus the starting address and allows internal address counter to properly generate the next memory location. The bigger the size, the faster the DRAM performance. Setting options: *4 Beats*, *8 Beats*.

#### **ECC Configuration**

The sub-menu sets the ECC (short for Error Checking & Correcting memory, a type of memory that includes special circuitry for testing the accuracy of data as it passes in and out of memory) options for cache and DRAM scrubbing.



#### **Master ECC Enable**

Master ECC enables support on all nodes for ECC error detect and correction.

#### **IOMMU Option Menu**

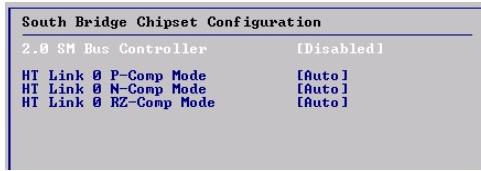
The sub-menu controls the *IOMMU* function. IOMMU is supported on LINUX based systems to convert 32-bit IO addresses to 64 bits.



## **MS-9131 SSI Mainboard**

### **SouthBridge Configuration**

The sub-menu shows the configuration options for the SouthBridge chipset.



#### **2.0 SM Bus Controller**

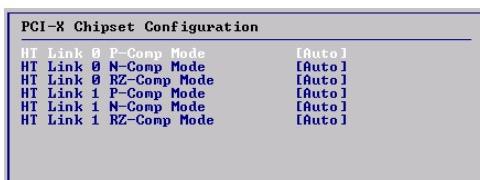
This setting disables/enables the 2.0 System Management Bus Controller.

#### **HT Link 0 P-Comp Mode, HT Link 0 N-Comp Mode, HT Link 0 RZ-Comp Mode**

*Auto* causes hardware compensation values. Other choices allow the user to override default compensation with an absolute value, add to the hardware generated value, or subtract a value from the generated value.

### **PCI-X Configuration**

The sub-menu shows PCI-X configuration options.

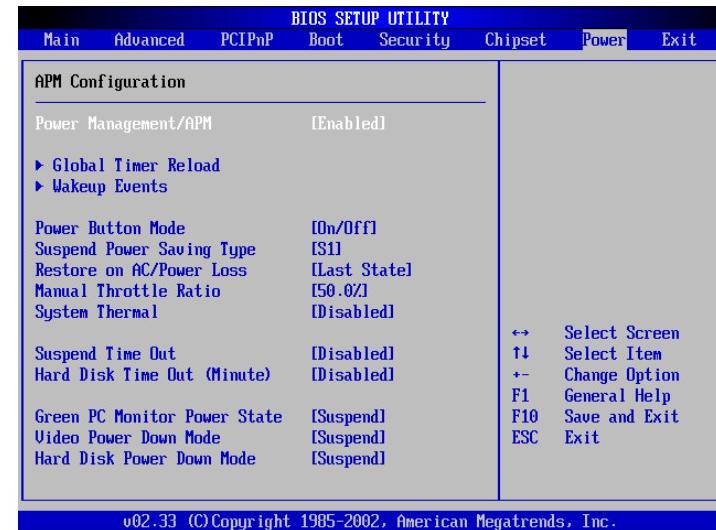


#### **HT Link 0 P-Comp Mode, HT Link 0 N-Comp Mode, HT Link 0 RZ-Comp Mode, HT Link 1 P-Comp Mode, HT Link 1 N-Comp Mode, HT Link 1 RZ-Comp Mode**

*Auto* causes hardware compensation values. Other choices allow the user to override default compensation with an absolute value, add to the hardware generated value, or subtract a value from the generated value.

## Power

The Power Menu allows you to configure your system to most effectively save energy while operating in a manner consistent with your own style of computer use.



### Power Management/APM

Setting to *Enabled* will activate an Advanced Power Management (APM) device to enhance Max Saving mode and stop CPU internal clock. Setting options: *Disabled*, *Enabled*.

#### Global Timer Reload

Global Timer Events are I/O events whose occurrence can prevent the system from entering a power saving mode or can awaken the system from such a mode. In effect, the system remains alert for anything which occurs to a device that is configured as *Enabled*, even when the system is in a power down mode.

#### Wakeup Events

This setting specifies whether the system will be awakened from power saving modes when activity or input signal of the specified hardware peripheral or component is detected.

**Power Button Mode**

This feature sets the function of the power button. Setting options: *On/Off*, *Suspend*.

**Suspend Power Saving Type**

This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 98SE, Windows ME and Windows 2000, you can choose to enter the Standby mode in S1(POS) or S3 (STR) fashion through the setting of this field.

**Restore On AC/Power Loss**

This setting specifies whether your system will reboot after a power failure or interrupts occurs. Available settings are:

- |                   |   |
|-------------------|---|
| <i>Power Off</i>  | Leaves the computer in the power off state.                                 |
| <i>Power On</i>   | Reboots the computer.   |
| <i>Last State</i> | Restores the system to the status before power failure or interrupt occurs. |

**Manual Throttle Ratio**

The item allows you to specify the CPU speed (at percentage) to which it will slow down when the CPU reaches the predetermined overheat temperature.

**System Thermal**

This setting disables/enables the System Thermal function.

**Suspend Time Out**

If system activity is not detected for the length of time specified in this field, all devices except CPU will be shut off.

**Hard Disk Time Out (Minute)**

When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

**Green PC Monitor Power State**

Use the setting to determine the manner in which the Green PC compatible monitor conserves power. The Green PC monitor is compliant to DPMS (Display Power Management Signaling) specification and uses the Horizontal and Vertical sync signals to control the power state of the monitor. Setting options: StandBy, Suspend, Off.

\*Standby—RGB guns off, power supply on, tube filaments energized, (screen

saver mode)

\*Suspend—RGB guns off, power supply off, tube filaments energized.

\*Off——Small auxiliary circuit stays on to monitor the HS/VS signals to enable power on when data needs to be displayed on the screen.

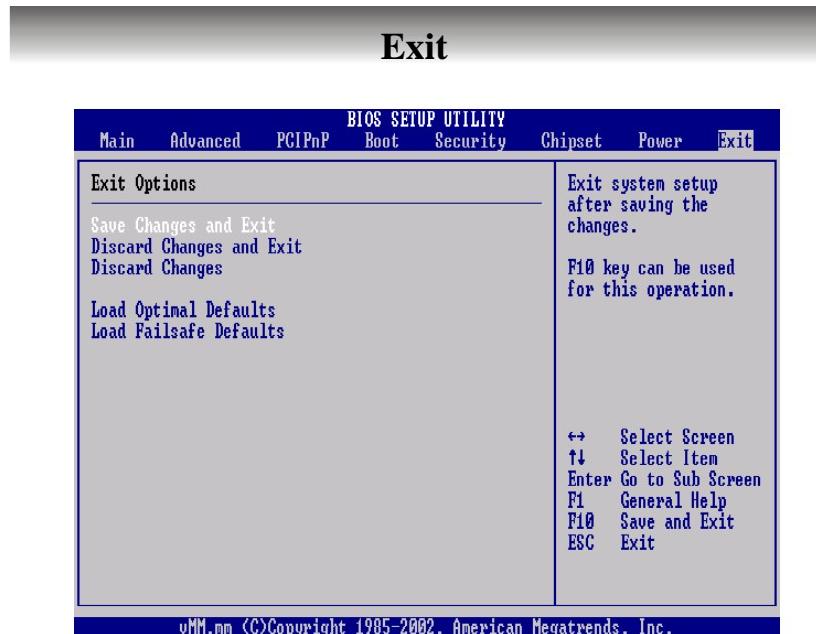
**Video Power Down Mode**

This setting controls the method used to put the monitor into low-power mode.

Setting options: *Disabled, StandBy, Suspend, Sleep*.

**Hard Disk Power Down Mode**

This setting specifies the hard disk power down mode.



#### **Save Changes and Exit**

When you want to quit the Setup menu, you can select this option to save the changes and quit. Selecting *OK* will allow you to quit the Setup Utility and save the user setup changes to RTC CMOS. Selecting *Cancel* will return to the Setup Utility. The F10 key can be used for this operation.

#### **Discard Changes and Exit**

When you want to quit the Setup menu, you can select this option to abandon the changes. Selecting *OK* will allow you to quit the Setup Utility without saving any changes to RTC CMOS. Selecting *Cancel* will return to the Setup Utility. The ESC key can be used for this operation.

#### **Discard Changes**

The option allows users to restore all of the BIOS settings to previous values. Selecting *OK* loads the previous BIOS values into the Setup utility. The F7 key can be used for this operation.

#### **Load Optimal Defaults**

The option allows users to restore all of the BIOS settings to the Optimal

Defaults. The Optimal Defaults are the default values set by the mainboard manufacturer specifically for the optimized performance of the mainboard. Selecting *OK* loads the default factory settings for optimal system performance. The F9 key can be used for this operation.

**Load Failsafe Defaults**

The option allows users to restore all of the BIOS settings to the Failsafe Defaults. The Failsafe Defaults are the default values set by the BIOS vendor for the most stable system performance. Selecting *OK* loads the BIOS default values for the most stable, minimal system performance. The F8 key can be used for this operation.

# **Troubleshooting**

**Q: Where can I find the model number of the mainboard?**

A: There are two places where you can find the model number of the mainboard:  
1. Somewhere between the PCI slots you shall find MS-xxxx or the marketing name like "K7T Turbo". You can also find the version number beside it. 2. At the back cover of the user's manual.

**Q: What do you mean by PCB version 1?**

A: PCB is printed circuit board. Saying PCB version 1 is the same as saying motherboard version 1.

**Q: I used my MSI motherboard and got an error message, "Primary IDE Channel No 80 Conductor Cable Installed" while the system detected hard drives.**

A: This is not a problem. It merely means that you're using an ATA-66 or ATA-100 HDD, but you're using the 40-pin ATA-33 cable.

**Q: I have high speed CPU cooling fan like Taisol CGK760092, Vantec CCK-6035D & GlobalWin WBK38. Can I install the fan directly to the motherboard?**

A: We strongly recommend that you do NOT connect those described CPU fan directly to your motherboard, as it draws so much power, that it could damage it. Please use a 3-Pin to 4-Pin Cable that comes together with the fan.

**Q: Can I use more than 512MB memory on Win9x or WinME?**

A: No, you can't. You can only use more than 512MB memory on Win2000 or WinXP. This is a Microsoft OS issue. Please check <http://support.microsoft.com/support/kb/articles/Q108/0/79.ASP>

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**Q: I have tried to download the MSI Live Update utility from <http://www.msi.com.tw/support/liveupdate/livedriver.htm> but it keeps on failing?**

A: This can be solved by one of the following suggestions: 1. Dont install zonealarm 2. Disable "WebTrap" of PC-cillion 2000 3. Disable any web based anti-virus Software.

**Q: Can Live Update Series support WinXP?**

A: Live Update Series version 215 can support WinXP. Download it from <http://www.msi.com.tw/support/liveupdate/livedriver.htm>

**Q: After flashing the BIOS, my system for unknown reason fails to boot. What should I do?**

A: Please refer to the following suggestions: 1. Try the BIOS boot recovery feature as described in <http://www.msi.com.tw/support/bios/boot.htm> 2. Try to clear the CMOS If problem still persists, ask your reseller for new BIOS chip or contact one of MSI office near your place for new BIOS chip <http://www.msi.com.tw/contact/main.htm>

**Q: Should I update my BIOS, once a new BIOS is released?**

A: A new BIOS is usually released due to the following reasons:

1. New function is supported
2. New BIOS source code
3. Bugs are found
4. Customer-specific request

When we release a new BIOS, there's usually a release note attached which lists the reason for the release. Refer to this release note and decide for yourself if upgrading to the new BIOS will be worth it. A word of advice, though, do not upgrade to the new BIOS, unless you really have to.

**Q: How do I update the BIOS?**

A: Please refer to <http://www.msi.com.tw/support/bios/note.htm> for details.

## ***Troubleshooting***

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### **Q: How do I identify the BIOS version?**

A: Upon boot-up, the 1st line appearing after the memory count is the BIOS version. It is usually in the format:

1. For older model number:

AG76091096 where:

1st digit refers to BIOS maker as A = AMI(R) W = AWARD(R) P = PHOENIX (R).

2nd digit refers to the internal chipset code.

3rd digit refers to the processor class as 5 = 486, 7 = 586, 8 = 686.

4th digit is incremental.

091096 refers to the date this BIOS is released.

2. For newer model number:

W5139MS V1.0091096 where:

1st digit refers to BIOS maker as A = AMI(R) W = AWARD(R) P = PHOENIX (R).

2nd - 5th digit refers to the model number.

6th - 7th digit refers to the customer as MS = all standard customers.

V1.0 refers to the BIOS version.

091096 refers to the date this BIOS is released.

### **Q: After I flashed the BIOS and rebooted the system, the screen went blank.**

A: **For AMI BIOS**

Rename the desired AMI BIOS file to AMIBOOT.ROM and save it on a floppy disk. e.g. Rename A9131KMS.ROM to AMIBOOT.ROM

Insert this floppy disk in the floppy drive. Turn On the system and press and hold Ctrl-Home to force update. It will read the AMIBOOT.ROM file and recover the BIOS from the A drive.

When 4 beeps are heard you may remove the floppy disk and restart the computer.

### ***MS-9131 SSI Mainboard***

#### ***For Award BIOS***

Make a bootable floppy disk

Copy the Award flash utility & BIOS file to the said floppy disk

Create an autoexec.bat with "awdfl535 biosfilename" in the content e.g.

awdfl535a619mj21.bin

Boot up system with the said floppy (it will take less than 2 minutes before screen comes out)

Re-flash the BIOS & reboot.

# **Glossary**

## **ACPI (Advanced Configuration & Power Interface)**

This power management specification enables the OS (operating system) to control the amount of power given to each device attached to the computer. Windows 98/98SE, Windows 2000 and Windows ME can fully support ACPI to allow users managing the system power flexibly.

## **AGP (Accelerated Graphics Port)**

A new, high-speed graphics interface that based on PCI construction and designed especially for the throughput demands of 3-D graphics. AGP provides a direct channel (32-bit wide bus) between the display controller and main memory for high graphics quality and performance.

## **Bluetooth**

Bluetooth refers to a worldwide standard for the wireless exchange of data between two devices. Bluetooth requires that a low-cost transceiver chip be included in each device. The transceiver transmits and receives in a previously unused frequency band of 2.45 GHz that is available globally (with some variation of bandwidth in different countries). In addition to data, up to three voice channels are available. Each device has a unique 48-bit address from the IEEE 802 standard. Connections can be point-to-point or multipoint. The maximum range is 10 meters. Data can be exchanged at a rate of 1 megabit per second (up to 2 Mbps in the second generation of the technology).

## **BIOS (Basic Input/Output System)**

On PCs, an essential software that contains all the control code of input/output interface (such as keyboard, disk drives, etc.). It executes hardware test on booting the system, starts the OS, and provides an interface between the OS and the components. The BIOS is stored in a ROM chip.

## **Bus**

A set of hardware lines within the computer system, through which the data is transferred among different components. In a PC, the term **bus** usually refers to a local bus that connects the internal components to the CPU and main memory.

## **Cache**

A special memory subsystem that is used to speed up the data transfer. It stores the

## MS-9131 SSI Mainboard

contents of frequently accessed RAM locations and the addresses where these data items are stored.

### Chipset

A collection of integrated chips designed to perform one or more related functions. For example, a modem chipset contains all the primary circuits for transmitting and receiving data; a PC chipset provides the electronic interfaces between all subsystems.

### Clock Cycle

Clock cycle (or tick) is the smallest unit of time recognized by a device. For personal computers, clock cycles generally refer to the main system clock, which runs at 66 MHz. This means that there are 66 million clock cycles per second. Since modern CPUs run much faster (up to 533 MHz), the CPU can execute several instructions in a single clock tick.

### CMOS (*Complementary Metal-Oxide Semiconductor*)

CMOS is a widely used type of semiconductor, which features high speed and low power consumption. PCs usually contain a small amount of battery-powered CMOS memory to retain the date, time, and system setup parameters.

### DRAM (*Dynamic RAM*)

A most common type of computer memory. It usually uses one transistor and a capacitor to represent a bit. As the development of technology, the memory type and specification used in computer becomes variety, such as SDRAM, DDR SDRAM, and RDRAM. For further instruction, please see the table below:

Dynamic RAM (DRAM) Memory Technologies						
Type	First Used	Clock Rate	Bus* Width	Peak Bandwidth	Volts	
FPM (60,70ns)	1990	25MHz	64 bits	200 MBps	5v	
EDO (50,60,70ns)	1994	40MHz	64 bits	320 MBps	5v	
SDRAM (66MHz)	1996	66MHz	64 bits	528 MBps	3.3v	
SDRAM (100MHz)	1998	100MHz	64 bits	800 MBps	3.3v	
SDRAM (133MHz)	1999	133MHz	64 bits	1.1 GBps	3.3v	
RDRAM (Direct Rambus)	1999	400MHz	16 bits	1.6 GBps	2.5v	
DDR SDRAM (100MHz)	2000	100MHz	64 bits	1.6 GBps	3.3v	
DDR SDRAM (133MHz)	2000	133MHz	64 bits	2.1 GBps	3.3v	

\* Memory channel width (64 bits started with 75MHz Pentium)

Source: Computer Desktop Encyclopedia

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## **Glossary**

### **ECC Memory (*Error Correcting Code Memory*)**

A type of memory that contains special circuitry for testing the accuracy of data and correcting the errors on the fly.

### **EEPROM**

Acronym for Electrically Erasable Programmable Read-Only Memory. An EEPROM is a special type of PROM that can be erased by exposing it to an electrical charge. Like other types of PROM, EEPROM retains its contents even when the power is turned off. Also like other types of ROM, EEPROM is not as fast as RAM. EEPROM is similar to flash memory (sometimes called flash EEPROM). The principal difference is that EEPROM requires data to be written or erased one byte at a time whereas flash memory allows data to be written or erased in blocks. This makes flash memory faster.

### **EIDE**

Short for Enhanced IDE, a newer version of the IDE mass storage device interface standard developed by Western Digital Corporation. It supports data rates of between 4 and 16.6 MBps, about three to four times faster than the old IDE standard. In addition, it can support mass storage devices of up to 8.4 gigabytes, whereas the old standard was limited to 528 MB. Because of its lower cost, enhanced EIDE has replaced SCSI in many areas. There are four EIDE modes defined. The most common is Mode 4, which supports transfer rates of 16.6 MBps. There is also a new mode, called ATA-3 or Ultra ATA, that supports transfer rates of 33 MBps.

### **EISA (*Extended Industry Standard Architecture*)**

EISA is a standard bus (computer interconnection) architecture that extends the ISA standard to a 32-bit interface. It was developed in part as an open alternative to the proprietary Micro Channel Architecture (MCA) that IBM introduced in its PS/2 computers. EISA data transfer can reach a peak of 33 megabytes per second.

### **ESCD (*Extended System Configuration Data*)**

It is a format for storing information about Plug-and-Play (PnP) devices in the BIOS. Windows and the BIOS access the ESCD area each time you re-boot your computer

### **External Cache**

Short for Level 2 cache, cache memory that is external to the microprocessor. In general, L2 cache memory, also called the secondary cache, resides on a separate chip from the microprocessor chip. Although, more and more microprocessors are including L2 caches into their architectures.

## **MS-9131 SSI Mainboard**

### **IDE (Integrated Drive Electronics)**

A type of disk-drive interface widely used to connect hard disks, CD-ROMs and tape drives to a PC, in which the controller electronics is integrated into the drive itself, eliminating the need for a separate adapter card. The IDE interface is known as the ATA (AT Attachment) specification.

### **IEEE 1394**

A new, high speed external bus standard, also known as **FireWire** or **iLink**, which supports data transfer rates of up to 400 Mbps for connecting up to 63 external devices.

### **Internal Cache**

Short for Level 1 cache, a memory cache built into the microprocessor. The L1 cache is also called the primary cache.

### **IrDA (Infrared Data Association)**

A group of device vendors, including computer, component and telecommunications, who have developed a standard for transmitting data via infrared light waves. This enables you to transfer data from one device to another without any cables.

### **IRQ (Interrupt Request Line)**

IRQs are hardware lines over which devices can send interrupt signals to the microprocessor. When you add a new device to a PC, you sometimes need to set its IRQ number by setting a DIP switch. This specifies which interrupt line the device may use. IRQ conflicts used to be a common problem when adding expansion boards, but the Plug-and-Play specification has removed this headache in most cases.

### **ISA (Industry Standard Architecture)**

ISA is a standard bus (computer interconnection) architecture that is associated with the IBM AT motherboard. It allows 16 bits at a time to flow between the motherboard circuitry and an expansion slot card and its associated device(s). Also see EISA and MCA.

### **LAN (Local Area Network)**

A computer network that covers a relatively smaller area, such as in a building or an enterprise. It is made up of servers, workstations, shared resources, a network operating system and a communications link. These individual PCs and devices on a LAN are known as “nodes”, and are connected by cables to access data and devices anywhere on the LAN, so that many users can share expensive devices and data.

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## ***Glossary***

**LBA (*Logical Block Addressing*)**

Logical block addressing is a technique that allows a computer to address a hard disk larger than 528 megabytes. A logical block address is a 28-bit value that maps to a specific cylinder-head-sector address on the disk. 28 bits allows sufficient variation to specify addresses on a hard disk up to 8.4 gigabytes in data storage capacity. Logical block addressing is one of the defining features of Enhanced IDE (EIDE), a hard disk interface to the computer bus or data paths.

**LED (*Light Emitting Diode*)**

A semiconductor device that converts electrical energy into light. Since it lights up (usually red) when electricity is passed through it, it is usually used for the activity lights on computer's component, such as disk drivers.

**LPT (*Line Printer Terminal*)**

Logical device name for a line printer; a name reserved by the MS-DOS for up to three parallel printer ports: LPT1, LPT2, and LPT3. It is frequently used by the OS to identify a printer.

**Overclocking**

Overclocking is resetting your computer so that the microprocessor runs faster than the manufacturer-specified speed (for example, setting an Intel 166 MHz (megahertz) microprocessor to run at 200 Mhz).

**PCI (*Peripheral Component Interconnect*)**

A local bus standard developed by Intel that first appeared on PCs in late 1993. PCI provides "plug and play" capability and allows IRQs to be shared. The PCI controller can exchange data with the system's CPU either 32 bits or 64 bits at a time.

**PnP (*Plug and Play*)**

A set of specifications that allows a PC to configure itself automatically to work with peripherals. The user can "plug" in a peripheral device and "play" it without configuring the system manually. To implement this useful feature, both the BIOS that supports PnP and a PnP expansion card are required.

**POST (*Power On Self Test*)**

During booting up your system, the BIOS executes a series of diagnostic tests, include checking the RAM, the keyboard, the disk drives, etc., to see if they are properly connected and operating.

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### **PS/2 Port**

A type of port developed by IBM for connecting a mouse or keyboard to a PC. The PS/2 port supports a mini DIN plug containing just 6 pins. Most modern PCs equipped with PS/2 ports so that the special port can be used by another device, such as a modem.

### **RAID**

RAID (Redundant Array of Independent Disks; originally Redundant Array of Inexpensive Disks) is a way of storing the same data in different places (thus, redundantly) on multiple hard disks. By placing data on multiple disks, I/O operations can overlap in a balanced way, improving performance. Since multiple disks increases the mean time between failure (MTBF), storing data redundantly also increases fault-tolerance.

### **SCSI**

Acronym for Small Computer System Interface. Pronounced "scuzzy," SCSI is a parallel interface standard used by Apple Macintosh computers, PCs, and many UNIX systems for attaching peripheral devices to computers. SCSI interfaces provide for faster data transmission rates (up to 80 megabytes per second) than standard serial and parallel ports. In addition, you can attach many devices to a single SCSI port, so that SCSI is really an I/O bus rather than simply an interface.

### **USB (*Universal Serial Bus*)**

A hardware interface for low-speed peripherals such as the keyboard, mouse, joystick, etc. USB provides a maximum bandwidth of 12 Mbit/sec (Mbps) for connecting up to 127 peripheral devices to PC. USB features hot swap capability and multiple data streams, allows external devices to be plugged in and unplugged without turning the system off.

### **Virus**

A program or a piece of code that infects computer files by inserting in those files copies of itself. The virus code is buried within an existing program, and is activated when that program is executed. All the viruses are man-made, and often have damaging side effects.

### **WLAN**

Acronym for wireless local-area network. Also referred to as LAWN. A type of local-area network that uses high-frequency radio waves rather than wires to communicate between nodes.